FRIENDS of Maine's Mountains

Senator Brownie Carson
Representative Ralph Tucker
Members of the Environment & Natural Resources Committee
March 27, 2019

Re: Solid Waste

As the committee familiarizes itself with solid waste policy, it would do well to understand a massive and growing solid waste buildup that most Mainers don't know about. Maine is currently host to approximately 400 grid-scale wind turbines, each with three rotor blades. Those 1200 blades are made of fiberglass, which is not recyclable.

While the Department of Environmental Protection requires a "decommissioning plan" from a wind project applicant, those "plans" are cursory in nature, and they never specify how the blades will be disposed of at the end of their usable life, which can be as short as ten years, particularly in harsh environments like Maine's.

At 200,000 pounds apiece, and as large as seafaring ships, these blades represent a future landfill liability for which nobody is planning. With 120,000 tons of fiberglass blades now in operation, DEP solid waste officials are assuming that landfills will be the final destination. But in response to FMM"s recent inquiry as part of a wind project permitting case, we learned that DEP is not actually *planning* for the eventuality in that assumption.

FMM does not have a prescriptive solution to this looming problem, but we bring to your attention that decommissioning plans which have been accepted by DEP are woefully inadequate in terms of responsibility and planning for blade disposal.

Please see the attached document that addresses the issue in further detail. It is the expert testimony submitted in the ongoing RoxWind permitting case. Once you read this alarming testimony, you should want to explore policy approaches that specifically address the looming environmental threat.

Thank you for the important work you do.

Bradbury Blake,
President

FMM OVERVIEW OF ROXWIND DECOMMISSIONING PLAN

If wind turbines can have an adverse impact on Maine's scenic quality, abandoned turbines can have a catastrophic impact. There are also land and water environmental risks from turbine materials, not to mention fires. And of course, they can harm our economy. But the primary decommissioning issue with abandoned wind turbines is the same as with the abandonment of any other commercial or industrial equipment: public safety hazards.

Abandoned wind turbines are akin to 50 story buildings atop mountain ridges. In darkness there is no way a low flying aircraft or flock of migratory birds is going to know the structures are present. The steel towers are magnets for lightning and concomitant fires where it is difficult to get suppression access. Abandoned structures are also major attractions for curious kids, and it is not worth the life of one teenager who thinks it would be cool to climb inside to see if it is possible to reach the top. The Rumford to Rangely area is snow country, and "it's too far to walk" does not apply to a group of snowmobilers in winter. In keeping with the expression "build it and they will come" we can project into the future a ridgeline of abandoned towers, and people who will find a way to get access, and to have their version of fun. Add alcohol or drugs and the potential problem is compounded. Maybe not the first year, or the second. But in time people will find their way to the abandoned towers and get hurt. *Then some unfortunate parent will be left wondering why "they" didn't get rid of the towers when they were supposed to.*

If the applicant builds and profits from potential public safety hazards, then the Department must hold them accountable for thorough removal when the structures are no longer functional. It is the only fair and responsible thing to do, yet it has to date never been fully discussed or addressed. Given the monumental liability, we applaud the Department for its effort to front-load the decommissioning fund. But it must be done right. As in so many of the decommissioning plans that have preceded this one, depth, specificity and accuracy are lacking. Given the risk, it is unconscionable that Maine would allow assurance based essentially on a few proverbial cocktail napkin scribbles. The recently published decommissioning plan for Weaver Wind, although its numbers are also suspect, at least makes an attempt to look like an actual plan.

According to the Department's Rule Chapter 382, salvage value is no longer allowed to the applicant as a credit in calculating its decommissioning fund. The applicant has apparently assumed that it is allowed such a credit, and after an FMM inquiry, there has been no procedural determination on that question. Regardless of whether the Department plans to allow the salvage credit in this proceeding, and FMM will provide testimony that covers either scenario, the applicant's decommissioning plan is inadequate.

There is little empirical industry information on the actual decommissioning of current grid scale wind turbine installations. But based on what we do know and employing some simple math, we conclude that the RoxWind decommissioning plan is multiple disasters waiting to happen.

In a nutshell, its estimated revenues from salvage value are excessive and its decommissioning reserve funds are inadequate to cover deconstruction costs. Given the precarious nature of the wind business model, the RoxWind decommissioning plan is bad both "coming and going."

The actual cost to reduce all the towers to market-ready scrap is substantially higher than projected in the plan, and the actual recoverable value from the scrap is substantially less than estimated by the applicant. Moreover, experience has shown us that fiberglass composite material, of which the massive blades are made, is a burgeoning disposal problem, especially as thousands of working blades nationwide are deteriorating and/or being repowered ahead of schedule. The Department must maintain its effort to require full funding, but the applicant's dollar estimates must be recalculated.

While the Department cannot control the usefulness of turbines, the total risk level posed should be fairly counted as no greater than the level of assurance achieved.

RoxWind Project Testimony of William Downes for Friends of Maine's Mountains:

Experts Are Rare

Friends of Maine's Mountains has asked me to evaluate the RoxWind decommissioning plan. They sent me the above narrative to explain their findings, and they asked me to submit testimony in support of that narrative.

I fully agree that the plan gives inadequate surety, and that the Department can and should take specific actions to provide greater surety.

I have researched the subject for years and have found very little expertise in the field of wind project decommissioning. I have interviewed traditional, long standing equipment appraisers about their experience doing reports on decommissioning wind turbines and none have had any experience. As a general guideline, these appraisers work mostly in the financial sector and prepare analysis of fair market values on equipment both at the financing inception and for the duration of the financing term to the end, i.e., the residual value. They lean towards conservatism in their estimates based on experience and empirical data. Consequently, wind project developers shun such appraisers when looking to have decommissioning plans created since they are looking for the highest value estimates possible.

In the absence of industry experience and established precedent, the wind industry has taken to using consulting firms and crane contractors that perform analysis based on a myriad of assumptions and various levels of detailed deconstruction costs. These firms have no experience in decommissioning wind turbines and rely at best on an academic approach including using individual cases when it supports their opinion. As we have seen in the past, decommissioning estimates are all over the map especially when it comes to "salvage value." Depending on venue the regulatory bodies reviewing decommissioning plans will look at salvage values based on local law and guidelines. In the absence thereof they will grant the developers whatever seems "reasonable."

One of the appraisers offered the following caution: whatever you expect it to cost (where there is limited industry experience) to reclaim equipment that has reached the end of its useful economic life it is highly probable that it will cost more and sometimes a lot more. An analogy was given using the railroad industry and tank cars. There are currently tens of thousands of used tank cars, predominantly used in the oil industry, sitting on rail sidings throughout the United States. Tank cars have general similarities to wind turbines but the experience in the rail industry in reclaiming them is an expensive proposition: some parts are long lived and can be refurbished and resold easily; the recovery of the major metal components is a manually intensive endeavor which needs to meet stringent recyclable standards; and the glass linings have to be prepared before being landfilled or burned in special incinerators. Some firms have arisen in the last few years that specialize in tank car recovery but the process is a money loser for most owners of used tank cars.

It is anybody's guess what price anodized steel plate (the towers) would fetch in the market. Guesswork should not be allowed in a decommissioning plan. I am not aware of any mill in the country that has a significant automated process for dealing with such zinc-laden material. As

with Union Pacific and its old tanker cars, it would cost more to prep the steel towers to meet "acceptable scrap standards" than the price one would fetch for the cleaned-up steel.

Another well-known example is the thousands of aircraft parked in the desert, because with materials and components similar to wind turbines, it simply makes more sense to abandon them than to reuse/recycle them.

In summary, what happens at the end of a wind turbine's life is a big unknown. Any risk should be borne by the owner and full verifiable security should be provided up front with contingencies built in.

In Absence of Expertise and Certainty, Employ Caution

There is little if any historical experience to guide decommissioning the newest generations of large turbines. Proposed wind projects all include decommissioning "plans" which place extremely high value on salvage recovery and market prices without any discussion of commodity market price changes or the costs to prepare the metal as acceptable scrap. One needs to look no further than EcoMaine for examples of the changes in commodity prices for recyclables. The same principles are in play for scrap industrial materials.

By way of introduction to the uncertainties of decommissioning, we have two instructive examples, one in New England, and one in West Virginia.

Falmouth, Massachusetts recently sent a decommissioning referendum to voters. Their referendum estimated two million dollars per turbine just to dismantle their two turbines which are located not in remote mountains, but in a flat industrial park setting. Again, there are no experts, but I think Falmouth's estimated "on the ground" cost was high. It is reasonable to think a professional firm experienced with turbines and cranes could take down for no more than $400,000 each, which includes preserving the functionality of the machinery if that is desired. My estimate does not include how to get rid of them. It is conceivable that turbines only a few years old could have some value for components or as replacement parts, but given the rate of turbine obsolescence, it is a stretch to think that any wind turbine will have resale market value beyond scrap, and as I will illustrate later, scrap estimates are highly speculative.

A decade ago a West Virginia community scrutinized the decommissioning plan for the Beech Ridge Wind Project. The applicant's plan projected scrap values at $12.64 million in current dollars. A third party consultant was hired to review the details of those estimated values. The consultant contacted the major regional scrap yard, which said the scrap was worth only $2.63 million after it was shipped to the yard and processed into acceptable sizes. That study concluded that a bond should be required for a minimum of $100,000 per turbine. (See *Hewson*, attached.)

The first pilot 1 MW turbine was built in 1999 and the turbine only became commercially available in 2001. The 1.5 MW Mars Hill turbines erected a decade ago are now ancient technology compared to the 3.8 GE turbines in the RoxWind proposal. There are only 10 years of experience with the "big" turbines. The real test of economic useful life is just beginning, and as I will illustrate later, we are seeing premature retirements worldwide.

It has been the consistent track record of the wind industry to leapfrog into the next technology before the old technology has proven itself. It is easy to dismiss the problems of the past when the industry can avoid addressing the long-term issues.

The trend toward bigger turbine size has been well-studied by researchers as to the likely problems associated with the added stresses and vibration on gearboxes and generator sets. These expensive components have not yet had sufficient operating experience to determine if the incremental size increase is worth the up-front investment versus the long-term maintenance and rebuild costs, particularly with severe Maine winter weather to exacerbate wear.

Today's turbines might very well be worthless in only a few years as the technology continues to leapfrog, and as energy markets evolve.

While the Department cannot control the usefulness of turbines, the total risk level posed should be fairly counted as no greater than the level of assurance granted.

The net cost today in California to remove 100 KW "Legacy" turbines that originally cost $250,000 to build is $15,000 - $30,000. So 10% of original acquisition might be a reasonable floor for our larger turbines, notwithstanding all the additional factors that render remote high altitude modern turbines increasingly costly.

RoxWind's estimated removal costs are alarmingly below the California 10% mark, and the high terrain and remote location in the Mahoosuc Range is certainly more challenging than it is in the desert.

The Department should assume that the applicant grossly underestimates both the cost to reclaim the land and the labor intensiveness that is required to disassemble and dispose of the turbines. They also neglect to add high disposal, transportation and scrap handling/processing costs. They further make specious value assumptions regarding resale or reuse of obsolete wind turbines.

This cursory and haphazard approach to all decommissioning submissions (I hesitate to call them "plans") leaves a vast gulf of uncertainty regarding decommissioning costs. If the project under review were a warehouse or some other easily repurposed facility, then that uncertainty would simply mean the developer is bearing some risk. Nothing unusual there. But the economic and land use aspects of mountain wind development are so unique and so impactful, the state is also assuming massive risk. Because of this public risk, the Department must either require the most conservative (higher) cost estimates, or ideally require a form of assurance that puts all the risk on a party that guarantees full responsibility irrespective of actual eventual cost.

Once the components are "on the ground" crews must be on-site to disassemble the turbines and handle the components. From there the components will typically be transported to a "lay down yard." All components must then be trucked away to final destinations, whether recycling, repurposing or disposal. Most of those components will require some level of processing, which is labor and time intensive. Those components that cannot be recycled must be disposed in landfills, the lowest option on Maine's solid waste hierarchy.

A 278' steel tower that has a base diameter of 16' has to be disassembled, cut into approximately +1,130 pieces no larger than 5' x 2', and transported to market. This endeavor alone will entail astronomical costs not delineated in the perfunctory decommissioning plan.

The numbers in the decommissioning plan appear to be sufficiently suspect to warrant a more robust decommissioning fund. This is to say nothing of RoxWind's financial capacity under the corporate umbrella of Palmer Capital, a company whose wind development credentials are thin. While it is good that licensees now fully fund decommissioning early, the scrap value is always overestimated, and the disassembly/disposal costs are always underestimated. Given the budget and the tenuous nature of the industry and its participants, it is possible that Maine wind projects will never be decommissioned unless the public pays the cost. The principals behind RoxWind lack the credentials of such developers as Berkshire Hathaway or Avangrid, so the present need for caution is even more acute in this plan.

According to Maine's decommissioning statue, the Department has discretion in deciding what form of financial assurance is both "acceptable" and "adequate." At the very least, the Department should use that discretion and err on the side of highest caution in *accepting adequate* levels of surety.

At best, the Department should require such surety from the decommissioning contractor as a condition of license. Not just a casual non-binding estimate for permitting purposes, but an actual enforceable contract. In satisfying the very low level of assurance in decommissioning plans, these crane contractors place high salvage values in their forecasts. If those same firms were to bid on the decommissioning of a wind project, where they were responsible for meeting Department removal standards, and were at risk and legally bound for recovery of all costs, including scrap prices, you can rest assured they would never cavalierly submit the same numbers that we routinely see.

Alternatively, the Department should require a third party performance bond or some deed covenant that assigns backstop responsibility to the landowner.

Following are further considerations that will lead the Department to requiring that higher level of assurance.

Crane Costs

According to one Texas company, a crane[1] will cost over $1000 per hour, or $40,000 per 40 hour week, before premium rates for overtime, holiday or weekend work. That is Texas, where turbines are on flat, open ground. Other wind industry estimates[2] show that crane rental can be as high as $400,000 per week.

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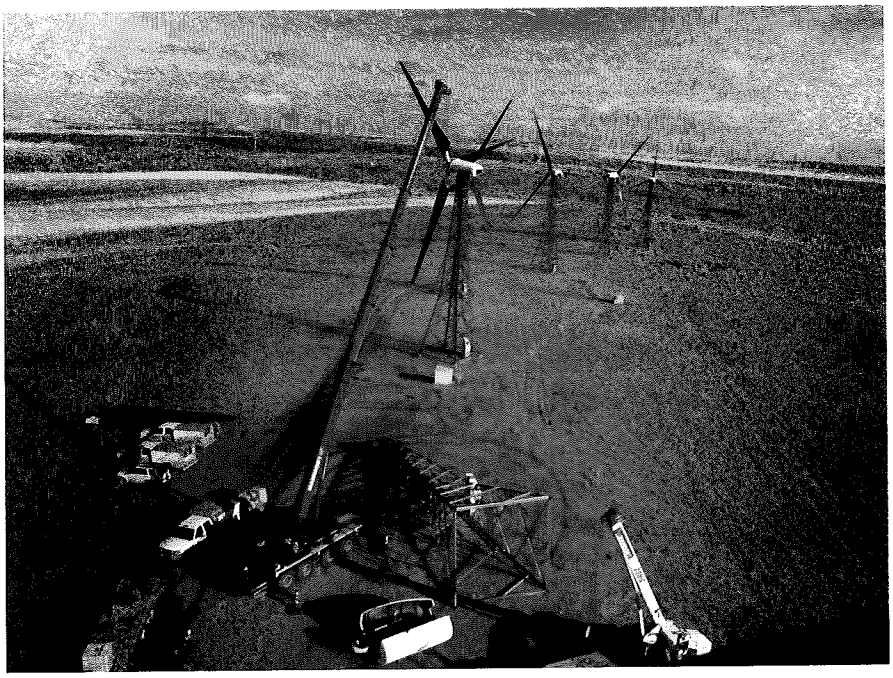
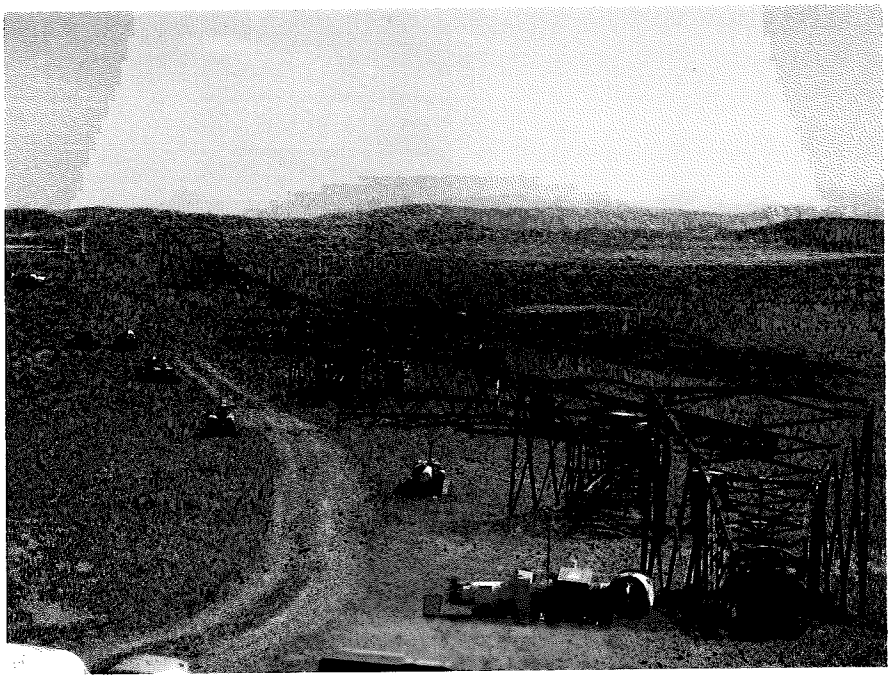
[1] http://www.crockercrane.net/Pricing.html

[2] http://www.windustry.org/community_wind_toolbox_8_costs

The Baldwin estimate in RoxWind's plan cites a recently decommissioned project in Alberta. It is clear from the photos below of that Cowley Ridge decommissioning that 75' turbines on the plains of Alberta were much more easily disassembled than would be 500' next generation turbines on remote wooded mountains. Rather than removing nuts & bolts from easily recycled lattice pylons, removing the RoxWind turbines would require far more work and cost. If Baldwin's estimate was guided by Cowley Ridge in making assumptions about decommissioning RoxWind, then we should essentially disregard Baldwin's entire estimate.





It is important to repeat that there are no true "experts" in the decommissioning of modern wind turbine projects in the Maine mountains because none have been removed from service. While both companies generally have great reputations and long successful histories, neither Baldwin nor Reed & Reed can be relied upon as experts in decommissioning wind projects.

There are reports of older generation wind projects being decommissioned but the technology and structures were very different from today's technology. The California and Hawaii experience with "Legacy" turbines has been troubled, despite the ease with which those turbines can be physically put on the ground. Cowley Ridge consisted of 57 turbines for a total capacity of 17 MW. They were able to recycle about 1,250 long tons of metal that recovered about 50% of the total costs of removal in salvage value. But all those easily accessible wind turbines were of the bare-metal, lattice style towers and deconstruction was a "clean" process. The coated metal of today's turbine towers, as well as their massive form, makes salvage a far greater challenge.

The decommissioning plan for the Bingham Wind Project stated optimistically on page 3 (Sewall) that two cranes will be needed for 31 weeks to remove Bingham's 52 turbines. This is an optimistic timeline, but for our purposes, let's accept it as a best-case schedule, and extrapolate that RoxWind's four turbines would require one crane for six weeks. At $40,000 per week, the RoxWind crane cost would be $240,000 before associated crane costs like gaffers, flagmen, drivers, crane operators, overtime, police escorts...they all cost additional money. As such, the Baldwin estimate would appear reasonable. However if the crane charge is $400,000 per week, then RoxWind should be setting aside about $2.5 million for the pre-associated cost crane expense.

Although the Baldwin "estimate" lists some particulars like hourly rates for certain positions, and it also estimates an overall projected cost, it does not project a total time for full decommissioning. So it is impossible to check Baldwin's math, yet Baldwin includes open-ended contingencies allowing the charges to increase as work time increases.

The Reed & Reed estimate provides even less specificity on these critical factors.

As seen in many dollar estimates within the decommissioning plan, this vast gulf of uncertainty regarding crane costs should instruct the Department to either require the more conservative (higher) estimate, or simply require a level of assurance that puts the risk on a third party that will guarantee full responsibility irrespective of actual eventual cost.

Scrap Values

Attached is a copy of **Scrap Definitions**. Please note that "#1 Steel" assumes maximum size for length and width, and it excludes "coated" steel. Wind turbine towers are coated inside and out to prevent rusting, normally with high zinc content. Protective metal coatings contaminate the smelting process so such steel sells at a discount to raw steel, if it sells at all.

Assuming they can be recycled, the maximum size of scrap to be processed is determined by manageable size. A typical 85 meter tower is approximately 16 feet in diameter at the base and 10 feet in diameter at the top. The steel thickness at the base is typically 2 inches while the steel thickness at the top is 1/2 inch. The most efficient method for cutting such steel is either acetylene or plasma torch. Using the maximum scrap size (5 feet by 2 feet) means that the 11,354 square foot surface area of one tower will be cut into approximately 1,130 pieces, with each piece requiring 14 linear feet of torch cutting. Assuming they could produce one piece every 30 minutes, each weighing an average of 440 pounds, they would finish cutting four towers in 2260 hours. There are no line-item provisions in the submission to account for tools, cutting fuel, scaffolding, material handling equipment and other incidentals. There is not even a discussion or calculation of total scrap weight. Assuming the scrap maximum size limit, cutting is likely to cost $50 per hour, resulting in $113,00 in just torch cutting labor costs given the remote site location. And this does not include any time allocated for work preparation and material handling, shipping, etc.

The history of scrap prices is volatile. There is no way to predict future prices, especially 25 years out. The conventional approach for future-year projections is to assume current prices, because all other costs will likely move in the same direction, more or less on pace with inflation. However, market forces can turn prices dramatically in a very short time, so maximum levels of flexibility and caution should be built into these decommissioning projections.

RoxWind provides no accounting of scrap values for handling, processing, transport, etc. Heavy Metal Steel (HMS) has very strict handling requirements in order to fit into smelting mills. Today's average prices nationwide for "unprepared" steel are in the $200/Ton range, depending on geography. Transport distance from the smelting mill is a major factor for local pricing and net cost, and we know of no such mills in the northeast. If the towers can be recycled at all, they will not fetch premium scrap rates. If we conservatively assume processing costs (disassembly, cutting, trucking, etc.) of $100/Ton, there is little incentive to recycle anything. If those costs reach $200/Ton, then there is no reason to believe anything will leave the site.

At best, the applicant's scrap value credits are overestimated. At worst, their net scrap value is negative, putting the project's proper decommissioning in peril, and putting Maine at risk of hosting hundreds of abandoned towers.

Whether the Department decides to allow scrap credit or not, the actual and eventual value will unavoidably impact the total responsibility allocated to whichever party. The aforementioned uncertainty should instruct the Department to either require a more conservative (higher) decommissioning estimate, or more ideally require a level of assurance that puts the risk on a third party that will guarantee full responsibility irrespective of actual eventual cost.

Fiberglass

A Danish utility installed 13 - 600 KW turbines in 1993. In 2006 the wind project was decommissioned as uneconomic (a 13-year economic useful life). The utility stated that the fiberglass composite blades disintegrated when touched by hand. The industry widely

recognizes that fiberglass disintegration is a problem, particularly on the trailing edge of blades, more particularly in harsh climates.

Beyond the contractor's estimate of $2,500 for "blade disposal," the RoxWind decommissioning plan is silent on the specific handling methodology for an estimated 1,500 tons of fiberglass composite material. This is a concern, given Maine's history of landfill debacles, and considering that fiberglass takes 500 to 2500 years to degrade in a landfill.

FMM was able to find two firms that are attempting to establish a fiberglass recycling industry. One is in the southeast and the other is in the northwest. FMM consulted with both on the disposal of fiberglass. They are:

American Fiber Green Products[3] Global Fiberglass Solutions[4]

They both consider the wind industry as an opportunity for growth. Both claim proprietary methods for fiberglass recycling, but their prices are high and it is unclear how strong the demand will be for recycled fiberglass at a time when as many as half a million turbine blades will be flooding the market in the US alone.

Their processes are labor intensive and costly, and their expensive re-manufactured products (like sewer hole covers and picnic tables) do not seem to be in high demand.

Ken McCleave of American told FMM that an easily accessible, processed (cut to pieces or pulverized) turbine blade of current average size would require at least a $5,000 disposal fee. Costs increase if the fiberglass is on the ground in an inaccessible lay down yard. Costs further increase as transport costs to Florida rise. They note that there is considerable copper wire in each blade, but that the copper is permanently encased in fiberglass, and as such that scrap copper is deemed too expensive to recover. American would not say how much they would charge RoxWind, but they opined that RoxWind's $2,500 per blade disposal cost was grossly inadequate. American advised that costs would be higher at a mountain in the Maine forest than at farm field in Iowa.

Brent Sherry of Global concurred on the inadequacy point, saying that RoxWind must be planning on landfilling the old blades. They also opined that $2,500 per blade would not cover take down costs, let alone the processing, transport, and tipping costs. Global quoted $6000 per blade, with the blades already in a laydown yard when Global arrives in Roxbury. Not familiar with Maine's solid waste history or current waste hierarchy protocols, Global also thought that landfilling must be the plan. Assuming that Maine allows landfill disposal for its current 1,200 in service turbine blades, Global projected that landfill disposal at best will become an increasingly expensive endeavor. At worst, they said, landfilling turbines will become a monumental environmental crisis worthy of prohibition. Global further said:

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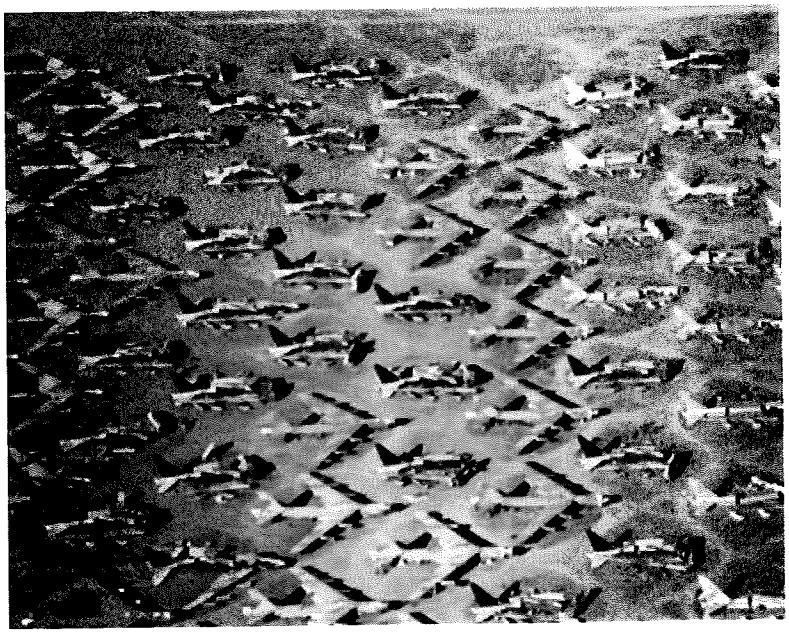
[3] http://americanfibergreenproducts.com/operations/wind-farm-blades-2/

[4] https://www.global-fiberglass.com

"The sum amount of $30,000 sounds like it's going to be a performed with little regard to the environment. My assumption is it'll be messy (fiberglass debris/particulates), done by a small one off concrete cutting company that makes a deal with a landfill. Liability of WTB waste is becoming a concern, with a grim future if not addressed early."

Sometimes it makes more sense to abandon an environmental mess than to deal with it. Take retired aircraft, for instance. Given the high costs for disposal and the low prospects for recycling, it is not unconceivable that Maine's poor planning will forced us to create massive laydown yards for retired turbines, similar to the abandoned aircraft in the American desert:



Regardless of how the RoxWind blades are finally disposed, there will be a high cost, and the decommissioning plan leaves massive uncertainty about what those costs are, and how they will be covered. This uncertainty should instruct the Department to either require a more conservative (higher) decommissioning estimate, or more ideally require a level of assurance that puts the risk on a third party that will guarantee full responsibility irrespective of actual eventual cost.

Economics

A word of added caution on a consideration beyond - but not irrelevant to – the Department's purview: economics

The estimated economic useful life of a wind turbine at 20 years is the point where escalating operating costs necessary to maintain the unit's minimum performance exceed recoverable revenues. It is customary in energy projects for equity investors to extract every unrestricted penny from the project's coffers as soon as possible. Restricted cash covenants are customarily set by the lenders and, to a lesser extent, by any government authority that has a vested interest in future financial performance. Once a lender is paid off, most financial covenants cease. If a wind project has inadequate cash on hand at the time of decommissioning it is unlikely that it will be able to fund the ongoing day-to-day de-installation of all turbines.

There is no market for an in-place wind project that does not work. Wind projects have no collateral value other than their net salvage value at almost every point in time after just a few years of operation. In virtually any other type of project, financed equipment can be dismantled, sold, and used elsewhere. With wind projects, siting and matching turbine configuration to a site will make it cost-prohibitive to relocate when one considers that the front-end subsidies sustaining the industry today would not be available for used or obsolete equipment.

If the lenders to a failed project see that they have a high probability of recovering a significant portion of any outstanding debt via net salvage, they would contract to dismantle and remove the turbines and towers. But do we seriously expect them to complete land reclamation and other obligations? The lenders are more likely to write-off the debt and walk away.

In that scenario, would the Department seek enforcement action against the turbine pad lease-holders? Are these private landowners ignoring any future reclamation responsibility possibilities or are they expecting that the applicant will fulfill its obligations? Would landowners be subject to any claims by the state as a last recourse to restore the land via reclamation, since they were financial beneficiaries of the project? Can we expect the landowners to plead ignorance and do nothing that might cost them a dime to fix the problem? Would the state take not only the land where the turbines are located but also all the access roads, buffers, and lead lines?

The state should minimize, or better yet, assume **no** risk in this regard.

All wind applications contain an egregiously erroneous presumption. In their "security" scenario is a banker's worst nightmare: to repossess an operating project -- and particularly an energy project.

First, no matter when it occurs it is certain that the bank officers directly involved in making the original loan will be fired for bad judgment if they are still with the bank -- and it doesn't matter even if it is 15 years later. It will happen.

Second, energy projects – particularly mountain wind energy projects -- are not commodities that can be turned around and sold like a repossessed car or a box store. Bankers have experience making loans but not operating the assets or facilities they finance. If the supposed experts at developing and operating an energy project cannot make it work, what makes us think that their bankers can do it better? Any potential recovery from a poor-performing asset means that the bank must take a big haircut because it now must find and engage professional, experienced third parties in order to rehabilitate the value of the collateral. The cost to do so is apparently never built into the decommissioning plan.

And third, bankers take on no liability in the legal structure of an energy project. If a project fails and a net recovery (even a partial recovery) is not assured, the bank will walk away from the project rather than risk additional capital, which would require new internal bank credit approval. A wind project applicant's presumption of low risk, whether explicit or implied, should be extremely troubling to the Department. To presume that a long-term lender is willing and prepared to step into a foreclosure situation to fix all the obligations of the owner/operator is fantasy. To illustrate the point: if the lender has properly evaluated the project then it will have required financial covenants that are in force throughout the entire loan period. These covenants will require, at a minimum, operating cash flow ratios that fund both *operating* and *debt service* reserves for 12-18 months. The initial and later-term reserve amounts will have been determined by *base case projected operating cash flows*. If the covenants are not in force or at inadequate levels then there will be a high probability of grave problems in the future. Do those exist here?

These wind projects are front-loaded with subsidies and bereft of liability to the parent entities. So the long-term economic viability of the projects matters little, if at all. Once the investors extract the money during the first ten years, their only interest in the later years is if they are somehow generating an abundance of cash flow. Once turbines become marginally profitable the owners/operators will likely walk away. If in the later years or at the end of the license period that an energy project is marginally or not profitable, and there is only the prospect of making money by getting more out of the salvage value than the cost of reclaiming the land as required by the decommissioning plan, then what is Plan B if the salvage value is low?

Inadequate decommission planning is at best irresponsible, and at worst calamity. If the project risks are non-recourse to the principals, what does the Department do then? Wind projects are single-purpose entities usually built by LLCs. These are not deep pocket corporations. As was the case during the 1990s in California, when wind projects hit tough times the operators/owners just walk away leaving the decommissioning up to the local communities. SunEdison's

bankruptcy is instructive. If a specific plan is not agreed to up front, which should include some type of periodic monitoring, Maine will be left holding the bag.

In summary, the Department should at the very least adjust the values claimed by the applicant. Ideally the Department should get binding guarantees that indemnify the state and local governments from responsibility.

William Downes

November 30, 2018

Prefiled Testimony of William Downes

Personally appeared the above named William Downes and made oath that the above is his free act and deed.

Dated:

David A. Lourie Maine Bar #1041