

Guest Speaker

WHERE THERE IS A WIND, THERE IS A WAY

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When I received Dr. Savino's invitation to be your speaker, I must admit I was at first surprised and amazed. My instant reaction was to ask, "Why me?" I protested that certainly few people in Washington are less qualified than I to talk about the winds. But on second thought, now I do understand why I am here today; I stand before you as "Exhibit A", a living, panting demonstrator of wind power.

Just as a pun is alleged to be the lowest form of humor, similarly a politician may be the lowest form of an energy machine. For example, starting from an almost zero knowledge of the subject before us today, but using my own wind power (lung power) - or hot air, you may say - I will now turn that nothing into a 15-minute speech. And that, I submit is a very real, though elementary, form of energy conversion.

Loosely harnessed, a vast amount of that low form of energy conversion is best known as the Congress. And that is why some folks irreverently refer to Capitol Hill as "Windy Knoll"; and the Congressional Record, where the amounts and velocity of our energy conversion are daily logged, is sometimes called "Cave of the Winds".

And, I want you to know that I have still another qualification which you may not suspect. I'm not kidding, it is literally true that back in 1906 I was born next door to a windmill factory, and I lived there until I was 5 years old. That was in a small town out in Northern Illinois. We lived next door to the Enterprise Windmill Co., and as a kid, often visiting the friendly farms of that area, I knew well the clank, clank, clanking sound of the windmills that pumped water on those farms. One of my own favorite toys in those days was a model windmill such as salesmen for the Enterprise Co. used in demonstrating their products to prospective customers.

But historically, it is significant that immediately across the street from that windmill factory there was located another factory, one that my own family operated for three generations, where we built corn shelters, grain elevators, hay presses and loaders, side delivery rakes, manure spreaders, and, fortunately, gasoline engines. So, the Enterprise Co. went broke, and we survived, because those gasoline engines gradually took the place of windmills on most American farms. And then, in turn, several years later those engines went out of use

when the rural electric cooperatives brought cheap, government subsidized power lines into most of the farms.

Also, when I was a sophomore in high school, the dramatics event of the year was our staging of an operetta called "Windmills of Holland". I was in the chorus and much of the time played part of a windmill. Suddenly, as I was preparing this talk, I remembered a verse from that operetta. I won't sing it, but I believe it went like this:

"Touch a button, you or me, and then that great electricity will do the rest, while we with zest will sit, and look our very best."

The plot of the show, of course, was the demise of the windmills, displaced by electricity.

So since childhood, I have been somewhat aware of the waxing and waning of wind power. But for 40 years or more I had not given the subject any serious thought until early last year when I received a letter from an Ohio constituent who urged that Congress solve our national "energy crisis" by encouraging the location of huge windmills on top of all tall buildings. He suggested that the Empire State and all other such skyscrapers, each could and should satisfy their own electricity needs by means of wind power generators.

Frankly, my staff and I assumed that constituent was some sort of nut. I'm sure my reply to him was little more than a courteous brushoff. But now that I've met you folks, I feel guilty about what I thought of him. I promise you, I'm going to dig into our files and resurrect his letter and take a more serious look at it. I expect to find it in the file we have labeled "Crank Mail", but maybe now we should file it under "Ideas Worth Considering".

And I judge that is precisely the significance of this NSF/NASA Wind Energy Conversion Systems Workshop. You have gathered to take a new look at some old ideas and technologies, long neglected, ignored, laughed at, which in the contexts of today and tomorrow begin to look very promising, and to me certainly very fascinating.

I am confident you are here to usher in a real technology resurrection, a very much deserved and needed second coming for wind power. In the perspective of centuries of human history, I suppose this would be no mere second coming but the umpteenth coming, only the latest of innumerable chapters in man's discoveries of how to make good use of the winds. All of us have been raised on the wise old adage that "It's an ill wind that blows no man good", and I take that wisdom to mean that nearly every wind could be put to some good use. So, we count on you who are here to see to it that that goal is accomplished.

I asked Frank Huddle, Senior Science Specialist at the Library of Congress, to tell me where, when, and how human beings first learned to

control and convert the winds for their own uses. Obviously, no man today knows the sure answers to those questions. But Frank is imaginative, and he is confident that observant savages very early learned the ways to harness the winds. Surely, primitive man (or was it first a woman) quickly noticed that a cold wind made him feel colder than cold without wind; so he (and she) retreated into the caves, not only for protection from animals but perhaps, even more so, from the winds.

And perhaps men first discovered fire by observing forest fires caused by lightning. But Frank says it is just as likely that he saw firey particles dropping from branches of trees forcibly rubbed together in a high wind, and so perhaps the wind taught him to make fire.

Certainly man's discovery of the sail was one of the most important technological innovations of all time; it converted his crude raft or dugout canoe into an ocean-spanning transportation system. Frank suggests the inspiration for that first sail may have come when primitive man watched curled leaves being blown across the surface of a pond.

Having harnessed the wind for transportation, it was inevitable that man should similarly harness it to grind his grains and pump his water. I'm told that the windmills of Holland enabled the Dutch to reclaim vast acreages from the sea; and in Yorkshire, England, they also were used to pump water from the lowlands.

I already have mentioned that era in Midwest America when most farmers used patent windmills to pump water from wells for themselves, their livestock, and crops. But then came cheap electricity to do those chores, and so not many of those old mills are clanking today.

So, always, as civilization advances, technology and economics interact and what's new replaces the old. But, often what's new is merely an updated version of what's old. And that, I repeat, seems to be what this Wind Workshop is all about.

Now, gentlemen, I'm going to conclude these remarks by tossing at you a list of 4 or 5 personal opinions which perhaps have some bearing on your work here. There's a great deal of interest and concern in the Congress about today's so-called "energy crisis". It's a very popular, fashionable subject on "Windy Knoll"...lots of speeches, hearings, studies, reports, etc. But I do not pretend here to speak for the Congress or for any other members. These opinions (hopefully somewhat provocative) are strictly my own. I will state them with little or no attempt to explain or defend; they are tossed to you just for what they may be worth.

FIRST OPINION - I am convinced that we in the U.S.A. should decide right now, as a matter of national policy, to free ourselves from any dependence on oil or natural gas; we should completely back away from those fuels as major energy sources.

Now, I don't pretend to know exactly when that revolutionary change might be fully accomplished, but I would hope it could be largely underway before the end of this century, less than 30 years away.

My present guess as to a time table is that for the short run, the next 8 to 10 years, we will be forced to scramble in every direction for our energy using a lot of undesirable expedients, such as unhappily increasing reliance on Mideast oil and temporarily postponing some of the desirable, stricter environmental standards. But, I emphasize, that should be a short-term temporary situation.

In the intermediate period, from 1980 to past the end of this century, we must encourage an increasing reliance on our still immense coal resources (by coal gasification and liquefaction) as well as construction of conventional nuclear fission power plants (with increasing emphasis on safety and environmental controls) and then the breeder reactors, as quickly as they can be proved practical.

But for the long run, a third stage from the year 2000 on, certainly our energy goals must emphasize thermonuclear fusion, and most important of all, ultimately a major reliance on solar energy.

And am I not correct that the energy in the winds is in fact a form of solar energy, a product of solar heat beating down on our earth and sea surfaces? So, it seems to me entirely reasonable that your big goal in this important three-day workshop should be a major change in that timetable I have just outlined. Perhaps a dramatic shortening of the timetable could be brought about by bringing on line commercially feasible wind energy conversion systems (and thus, a form of solar energy) well before the end of this century, long before any of us have thought possible!

SECOND OPINION - Obviously, the success of that revolutionary shift to new energy sources can be accomplished, and hastened, only by means of a massive, diversified, but selective and coordinated, energy research and development effort, probably including some so-called "crash" programs. And, of course, that R & D will require federal appropriations at levels and at a pace not yet contemplated in any budget proposals of which I am aware.

Within the next year or two there must develop a concentrated emphasis and momentum for energy related research if we are to have any chance at all of bringing on line in practical, commercial form those alternative energy sources that will be so necessary by the turn of the century.

I am guessing there might be general agreement that the prime candidates for considerably greater R & D funding should be the following:

- (1) Coal stack gas removal,
- (2) coal gasification and liquefaction, plus vastly improved

techniques for mining safety and environmental protections in mining,
(3) fast breeder reactors, with increased emphasis on alternatives
(gas cooled?) to the currently emphasized liquid metal fast breeders,
(4) long term nuclear waste disposal technology,
(5) thermonuclear fusion,
(6) solar energy,
(7) pollution controls, and
(8) energy conservation technologies, including new concepts in
building construction, more efficient storage and transmission of elec-
tricity, and surely more efficient, economically feasible, productive
systems for recycling wastes.

Much of that R & D effort will be extremely sophisticated - far out
stuff, terribly costly, and at best a big gamble, adventuring into the
unknown. I believe those big investments are necessary, even though they
are a gamble.

But the point I reiterate right now is this: In our fascination
with sophisticated and costly new technologies, we will make a tragic
mistake if we ignore those great opportunities that exist in new uses of
older, familiar and relatively simple technologies...and, of course, by
that I mean it is very important that we adequately fund this fresh,
innovative look at wind power. I repeat the point made early in these
remarks, that innovation more often than not means a new, imaginative
look at old information and old experience.

THIRD OPINION - My third opinion is a quickie, merely to express
my doubt that there exists in Washington today, either in the Congress
or in the Executive Branch, a sufficient understanding or adequate, ef-
fective, decision-making machinery to provide the aggressive leadership
and national policy decisions which are desperately needed in the realms
of science and technology...and especially needed to solve our energy
problems.

I see some hope in our authorization of the Office of Technology
Assessment, as a new staffing arm of the Congress. If and when it is
funded, OTA should provide innovative impetus. I also see hope in the
new presence of Charles DiBona and his energy staff at the White House
level. And I believe the Administration's reorganization proposal makes
good sense, that we create a new umbrella Department of Energy and
Natural Resources. But, as yet, I see no sign that OMB (the Office of
Management and Budget) is likely to approve really adequate R & D fund-
ing in the near future. However, I can assure you that there are at
least a few of us in the Congress who are aware, and pushing for the
level of determination and effort we believe is imperatively needed.

Time itself is a major human resource, a major national resource.
We must use it wisely, effectively, vigorously; we must not fritter it
away, and that is why I am so heartened by your efforts here.

And, of course, the winds are no respecter of national boundaries

or national sovereignty. They blow alike on the just and the unjust. Certainly, in the winds we have a superb opportunity for sharing the fruits of scientific and engineering effort with all mankind. So, I am heartened to know that there are representatives here from several other nations, as well as our own.

I salute you all!

And now in closing I have a slogan to suggest for your workshop. It results from my very strong feeling that in our national science policy today we are somewhat lacking in sufficient commitment; we need a greater sense of purpose and urgency, a sense of the will to overcome our problems.

All of us know that old saying "Where there is a will there is a way". So I suggest the guiding motto for this workshop should be a slight variation on that theme:

"Where there is a WIND, there is a way!"