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Mr. Chairman, my name is Jeff Metts and I serve as President of Dowding Machining, a manufacturing company founded in 1965 and located in the great state of Michigan. On behalf my colleagues at Dowding/MAG, thank you for holding this hearing today to discuss a path forward in the new energy economy and the role that wind manufacturers can play in building a world class industry through a needed transformation of the American industrial base. We are particularly grateful to Senator Stabenow for helping make possible our participation today, and I want to recognize the assistance of her staff.

In 1962, President Kennedy stood before a stadium full of students at Rice University. He described to them a vision; that the United States would begin a project to reach the Moon. I know he did not tell them it would cost more than the Panama Canal. I am also sure the President had no idea the technology advances and discoveries would touch every area of human life. Nobody could know what technology would be birthed from his reaching this unimaginable goal.

To the students, it must have seemed impossible, we had only gone 162 miles into space. The President told them we would go 240,000 miles from the Earth, in a 300-foot spaceship that had not yet been invented, made from metals that had not yet been discovered. Guided by a system that had not yet been developed, land them on the Moon and then return them safely to the Earth, and do it before the end of the decade.

He also said to accomplish this “We must be bold”. Kennedy changed the world and our lives, forever. We are once again at a turning point in our Nation's history, we can and will change the lives of our children and grandchildren, and once again, we must be bold.

The United States may be in the perfect storm. Though it is a time of great trial, it is also a time of unparalleled opportunity. This economic downturn has put job creation on the mind of every citizen in this America. Today, this nation is in need of solutions that

empower entrepreneurs and create new employment opportunities in our communities.

We are confident, as Americans, we can solve this crisis better than anyone in the world. This nation will respond with the same innovation, ingenuity and excellence that put America in space. As part of our recovery effort, the President is calling for 20% of our energy needs to come from renewable sources by 2025. As a business owner, as a citizen, I am here today to support the effort to grow the renewable energy industry.

As never before, there is now a public will to wean ourselves from foreign oil. “Green” has become as common a word as the “Hot Dog”. As the nation searches for solutions and employment opportunities, the President has answered, and as part of the recovery plan, is calling for 20% of our energy needs to come from renewable sources by 2025. For once, we have immediate answers that seriously address the issues of less oil and the growth of our carbon footprint; that answer is renewable clean energy. Within that solution is the by-product of the creation of good high paying jobs.

We are here with solutions, but like everyone else, we have a similar problem, there are no funds available. Our core business is off 50%; we have gone from 250 employees to 147 in 6 months. We are not just positioning ourselves to ride out this storm. We are not quitters! We are not depressed or hunkered down waiting for this economy to turn around.

We have invested millions of dollars into an idea that is now exploding into technology advances that are providing us a competitive edge in global clean energy markets. However, the current economic conditions make tax abatements, guaranteed loans and bank financing an unusable formula to leverage private investments. We are asking for grant money that will allow a real opportunity for unprecedented success in this industry.

American innovators have designed energy technologies that will be the envy of the world. We will create tens of thousands of high paying permanent jobs here in the U.S. and deliver hope that there is a future with immediate employment opportunities and real solutions in renewable energy. Buildings will be built, employees will be hired, machines will be constructed and the spin-off from these technologies

will create thousands of jobs in industries that haven't been invented yet.

With a lack of oil and gas resources, Europe has been far in front of the U.S. in renewable energy for decades. In spite of our late start, we have become the world's largest installers of wind turbines in just a few short years. However, to meet the President's aggressive agenda, we will need to make fundamental changes in manufacturing processes. The United States installed approximately 4,000 wind turbines in 2008. During this same period, the European OEMs found it difficult to maintain supply flow to meet demand. In order to reach the goal of 20% renewable energy production by 2025, we need to increase the number of turbines installed from 4,000 to over 10,000 annually. Current production rates and serious quality issues must be addressed or we will fall short of the President's goal.

Because demand is outrunning production, the European manufacturers are getting components from overseas. It is not the best choice, by any means, for delivery, cost or quality. The United States has some of the best engineering and manufacturing minds in the world. These individuals have cut their teeth in the most fertile, advanced engineering market in the world, the automotive industry. The material advances we are introducing to energy components can only help revitalize the ailing auto companies. Bringing them into the future of strong, light weight and low cost components. These advancements can help reduce that industry's tooling costs by 70%.

These ideas will catapult the United States into this new energy market and immediately make us the energy standard in this major global market. Is there anything as powerful as the scientist, the engineer, and the entrepreneur all focused on the same motivation and goal? It is critical that we energize and involve them in this equation.

Dowding Machining entered the renewable market two years ago; we quickly identified the problems in the supply chain and began transferring the automotive production model into wind energy. The U.S. suppliers seemed unwilling to consider anything outside of the current European model, even though it utilized sixty-year-old technology. The United States is in a position much like Germany and Japan after World War II. We have the opportunity to develop a new industry with advanced engineering technologies. We knew we could

lower cost and improve quality and increase throughput by moving beyond legacy methods and developing state of the art machines and processes.

The size of these structures has grown dramatically, from Kilowatt outputs to now Megawatt. Machines have also grown to accommodate these significantly larger parts. The skill level of the worker is also at a high level. Michigan and the automotive community are ripe with a workforce able to easily step in and make wind turbine production parts utilizing world class automotive standards. The average wind turbine contains over 8,500 separate components. With volumes approaching 10,000 units a year, it only makes sense to adapt automotive and aerospace technologies to the manufacturing process of these parts.

Dowding Industries has been in manufacturing since 1965. We have re-invented ourselves several times over the years as the economic conditions and part processes changed. We made a conscious decision 10 years ago to find parts that would continue to be manufactured in the United States. We developed customers like Caterpillar, Cummins Engine, Borg Warner and others. Two years ago we invested 10 million dollars in a facility dedicated to renewable energy. We immediately advanced the thought process on manufacturing large components and brought it to an automotive mindset.

We chose MAG as our exclusive machine tool supplier. We chose them because of their understanding of the large machine tool business and the character of the company. Now we have partnered with MAG, the largest builder in America and third largest in the world for machine tool development. We are jointly designing specialized machinery for the wind turbine market. Dowding/MAG of Michigan has an incredible, game-changing opportunity to become the first in the world to introduce advanced manufacturing techniques to the fabrication of wind turbine components.

Our plan to modernize the machining of metal components will decrease machine time of wind turbine hubs from 24 hours to 3 hours and 20 minutes, this 70% reduction in machining time will cut the cost of production up to 50%. We are developing this technology in the four largest components, weighing from 10,000lbs to 40,000lbs, and expect similar improvements in all four machining processes.

Machining capacity and quality issues for these large components are a major constraint for this industry. This is a real solution that advances the U.S. and positions us to export this “made in America” competitive technology around the world.

Our second area of improvement is the manufacture of the turbine blades. Blade failures have increased dramatically as turbines have increased in size. Until recently, turbine blades were 90 feet in length. Today, many blades will exceed 150’ and offshore installations are expected to grow to 200’ and beyond. A recent article on Suzlon, an Indian wind turbine manufacturer, states they will set aside $139 million for warranty payouts on cracked blades which resulted in a 46% drop in stock share price this year. These type of failures are devastating to the growth of this industry. The technology advancement we are proposing, will eliminate these issues.

Blade manufacturing today is as old as the fiberglass boat business. All over the world these blades are made by hand. The use of hand layup methods has resulted in extensive field failures. Blades are separating (de-bonding) at the adhesive joint due to improper application of adhesive. Misalignment of blade skins and delaminating between layers of the fiberglass composite are major failure modes. This is not a world class process and demands efficiency and improvement. This “hand made” process is currently the most advanced technology available world wide, until now.

Continuous fiber materials as used in aerospace designs provide significant improvements in strength and durability. These high performance materials cannot be applied by hand. The key technology enabler that allowed today’s aircraft builders to change from aluminum and metal structures to composites lies in the ability to precisely align a continuous fiber to meet structural load requirements. Once again, this cannot be done by hand.

We are developing a fully automated process. This process will introduce the same carbon fiber technology used in the manufacture of modern aircraft. MAG pioneered the continuous carbon fiber placement technology and as a result of twenty-five years of research and development, they now lead the world in the aerospace composites market.

MAG machines are currently used to manufacture many different components in the aircraft industry. For example, the majority of the Boeing 787 fuselage, a major section of the A380 fuselage, portions of the F-35, the A400M, the C-17, the F-18 E/F, the Eurofighter, the V-22, the F-22, the Ariane 5, and the A350, among others.

Weight has become a major issue, affecting not only blade life and efficiency but also the ability of the structure to remain intact under increased stresses. The high weight of currently manufactured blades will shorten the useful life of yaw gears and other components. Repairs to wind turbines in the field are an extremely expensive proposition. We feel we can reduce the blade weight factor by 30%. This dramatically changes the life cycle cost of the entire turbine and lowers Kilowatt per hour cost.

Our blade manufacturing technology will give us the flexibility to incorporate innovative design architecture such as the “Twist Bend Coupling” (TBC) that can improve the turbine wind capture efficiency up to 10% over today's blade capability. We will embed part health monitoring sensor technology, giving the turbine OEM and the wind farm operator real time feedback on blade stress currently being experienced. This same technology can also enable “Smart Turbine” feedback which allows the turbine to react to adverse spikes in the operating environment, such as high wind gusts. The ability to incorporate de-icing technology is enabled through the utilization of our advanced manufacturing techniques.

The United States can and must be the birthplace of the lightest, strongest, lowest cost and most efficient wind turbine components in the world. These technology advancements will drive costs down, drive energy output up, improve quality, public safety and create excellent high paying American jobs.

It will take 10 to 14 blade plants to meet the 20% renewable energy goal. Each plant will create 1,400 jobs plus an additional 1,400 construction jobs, if new plants are built. The four machine metal components will need 9 to 12 facilities, each creating 150 jobs. We can manufacture the other 8,494 components in the existing automotive supply base already in place in the United States.

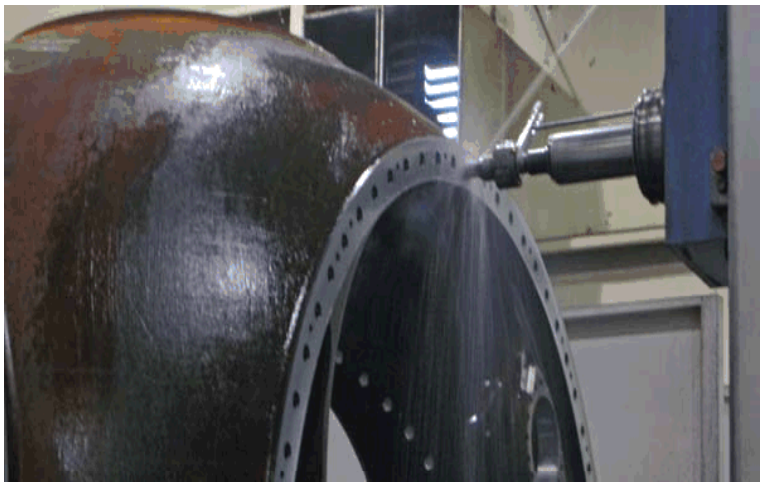
But, all of these technology upgrades, all of the advancements lowering cost per Kilowatt hour, all of the warranty cost reductions, all

of the productivity advances, all of the capacity advances, all of the thousands of high paying jobs, will remain just an idea if grant funding can not be acquired. The realization that the United States can become the world standard in wind turbine technology, outpacing the closest competitor by a decade of advances, again will remain just an idea if grant funding can not be acquired. For this to succeed we need the help of the government. NASA would have never happened without Federal dollars leading the way. Our military superiority would not exist if not for government intervention. The US will remain stagnant and follow other nations in the advancement of clean energy technology if additional federal funding is not quickly approved to leverage our technical and manufacturing capabilities. We have the drive, the ability, the technology and the passion to see this through.

We appreciate your time and support in our nation's search for solutions. We are poised to assume the role that manufacturers can play in re-building a world class industry through a needed transformation of the American industrial base. We believe we can bring relief to Michigan, a state which unfortunately has been at the leading edge of the economic calamity ravaging our nation.

Large Machined Components / Current Technology

- **Hubs produced on legacy equipment one hole at a time.**



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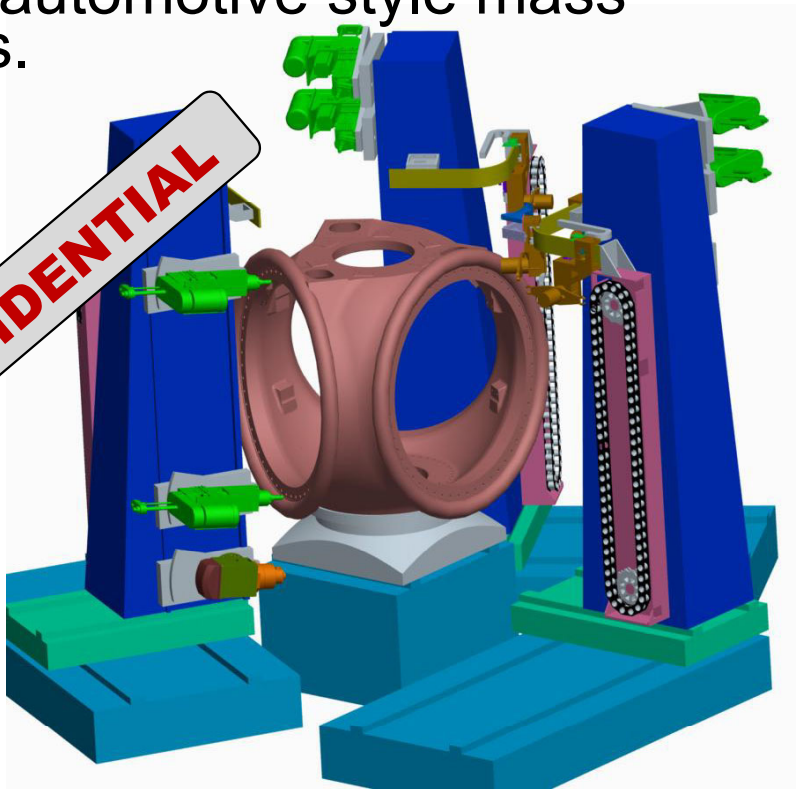
24 hours to machine this part

New Machining Technology Under Development by Dowding Industries and MAG

- New technology, machines three sides simultaneously using automotive style mass production techniques.

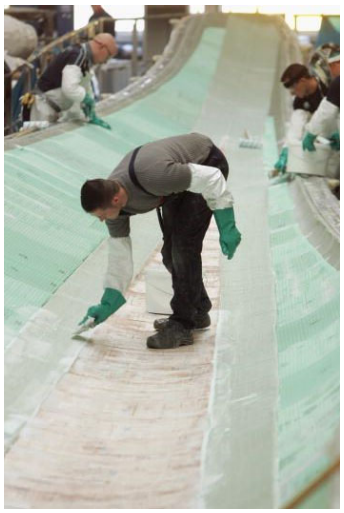
800% Increase In Throughput

3 hours to machine with new technology



Composite Fiber Components

- **Blades are currently made by hand**

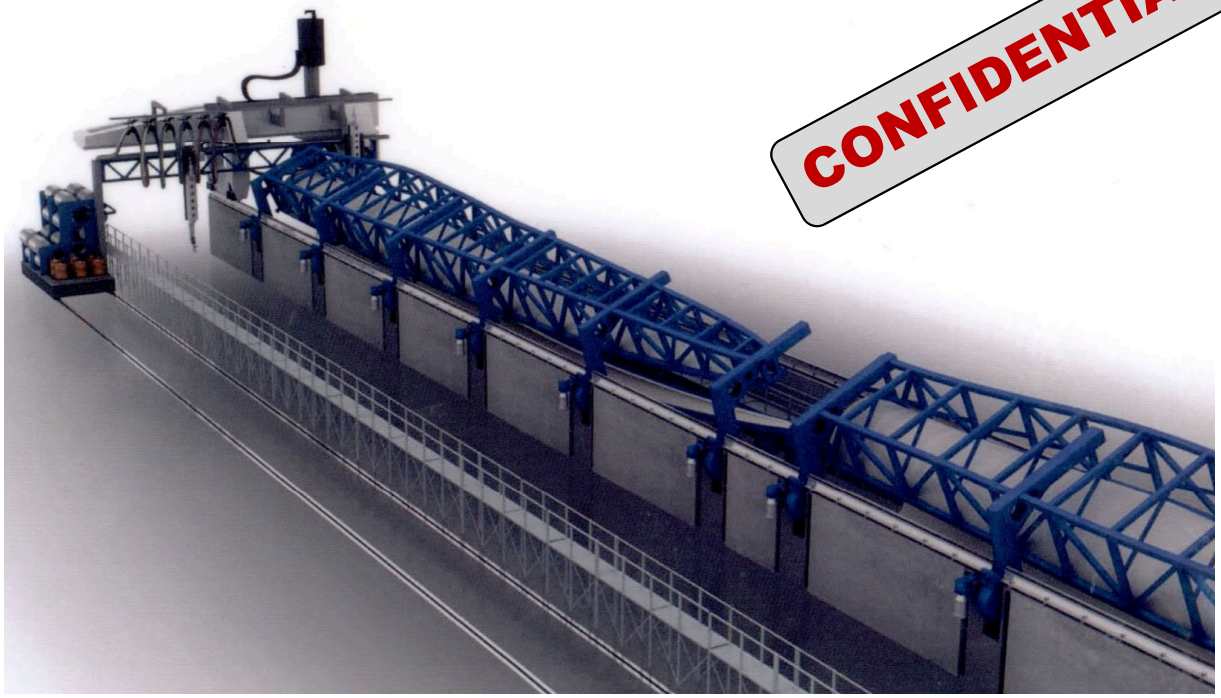


New Automated Fiber Placement Technology Under Development by Dowding Industries and MAG

- Computer controlled placement of fiber composite materials
  - Increase throughput
  - Improve quality and precision
  - Reduce weight- improving windmill efficiency

New Automated Fiber Placement Technology Under Development by Dowding Industries and MAG

- Automated blade assembly



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Rapid Material Placement
General Arrangement
Light Duty Gantry System

- Glass ply material is dispensed from a stationary ply generator.
- A multi-roll magazine supplies any of ten different rolls on command to the ply generator which cuts and dispenses the ply to a spooling end effector carried by the robotic gantry (Gantry #2 farthest from the foreground).

Rapid Material Placement
General Arrangement
Light Duty Gantry System

- Joining of blade halves