PRODUCTION OF POWER BY MEANS OF WIND-DRIVEN GENERATOR

HEARING
BEFORE THE
COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS
HOUSE OF REPRESENTATIVES
EIGHTY-SECOND CONGRESS
FIRST SESSION
ON
H. R. 4286
A BILL AUTHORIZING INVESTIGATION, RESEARCH, AND DEVELOPMENT WORK BY THE SECRETARY OF THE INTERIOR AND THE CONSTRUCTION AND OPERATION OF FACILITIES, INCLUDING NOT MORE THAN ONE DEMONSTRATION PLANT, TO DETERMINE AND DEMONSTRATE THE ECONOMIC FEASIBILITY OF PRODUCING ELECTRIC POWER AND ENERGY BY MEANS OF A WIND-DRIVEN GENERATOR OPERATED IN CONJUNCTION WITH AN ELECTRIC POWER SYSTEM, AND FOR OTHER PURPOSES

SEPTEMBER 10, 1931

SERIAL No. 16

Printed for the use of the Committee on Interior and Insular Affairs

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1932
structure is heavy enough to carry and drive a 21,000-kilowatt generator. Practically the only difference in the total cost between an 800-kilowatt and a 21,000-kilowatt unit is the difference in the cost of the generators, gears, and shafting of the two units. The cost of the mainframe, foundations, etc., is identical. With a 1000-foot diameter, a minimum structure will cost $170,000, excluding the generator and shafting. An 800-kilowatt generator with its gear and shafting will cost approximately $14,000, making the cost of the whole machine $184,000, or $290 per kilowatt, as was the case with the 1000-kilowatt machine. The difference ($290 vs. $220 per kilowatt) shows how difficult it is in general terms to talk about the cost per kilowatt of capacity for a wind-driven power plant. My calculations indicate that a 900-foot diameter generator will shaft stalls at 2500 rpm from 1500 to 2500 rpm in 1922, and we now know it. The new cost should be between $0.20 and $0.90 per pound. All other items excluding the generator, gears, etc., would run the cost up to approximately $170,000. Assuming our wind-driven power plant to be a 3700-kilowatt generator, the cost of the total installation would be approximately $237,000, or about $63.50 per kilowatt.

To get a 2500-kilowatt unit, we would need a total of 200,000-kilowatt-equivalent machines on one turbine at a cost of about $325,000. This figure does not include the cost of the land, transmission lines, transformers, or the supervisory control system. Nor does it include the cost of the special engineers which would be required for each individual site where an installation is seriously considered. One item of cost that applies to the first installation is for research and design. Another item of cost not considered, which may be of small or great moment, is down to three or four windmills. The buying of hoppers and rough places around the installation can often produce increased wind velocities that will result in higher output for the unit. Personally, I feel that the estimate of 2000 tons of 60 or 70-foot tower, for a cost of $1,500 each, and 6000 tons of 70-foot tower, for a cost of $1,500 each, is well worth the high on the side. I feel that the present day cost of labor and material will be sufficient to permit the time has arrived when we can build practical and dependable wind-driven power plants that will produce energy at lower cost than from any other source.

The Chairman. Thank you kindly. At this point I would like to have inserted in the record, a letter from the Jacobs Wind Electric Co., Inc., of Minneapolis, Minn.

The letter is as follows:

Mr. John R. Murphy, congressional Representative (Arizona),
Washington, D. C.

Dear Mr. Murphy: We have recently come to your attention that you are sponsoring a bill to finance experimental developments of a wind-electric plant, and we are very much interested in the contemplated legislation. The average wind velocity is about 30 miles per hour, and we require the output of the experimental machine designed by Percy H. Thomas. Could you supply us with the estimated kilowatt output in a 30-mile per hour wind of the plant? Mr. Thomas proposes giving also the power of the d.c. generator.

The reason we are interested is that our company is the oldest and leading manufacturer of wind-electric plants in the world, having started engineering and development work on wind-electric plants in 1922. We believe that the widespread installation of wind-driven booster plants, which we believe should be installed along existing high lines at frequent intervals, thus making the installation of the power lines, which would be connected into existing power lines, as booster lines, and secure maximum monthly kilowatt-hour output per acre of the wind-driven booster plants. We are giving you the above general details for your information, and would appreciate having from you regarding the possible development and use of wind-electric plants along the lines we have suggested, because we believe there is a 5000-kilowatt potential for also developing the widespread supply, quantity use of small wind-driven high-line booster plants.

We will appreciate your views, and look forward to your reply.

Yours very truly,

M. L. Jacobs, General Manager.

The Chairman. The committee stands adjourned at the call of the Chair.

(Whereupon, at 12 noon the committee adjourned.)