

A BRIEF HISTORY OF WIND POWER

The earliest known use of wind power for practical purposes dates to around 5000 years ago when the Ancient Egyptians began to use sails on boats to assist rowing slaves. Over time, Egyptians introduced sail technology in their farming, specifically to assist draft animals in grinding grain and lifting water. This marked the advent of early wind energy conversion systems (Park 1981). Historically, wind energy conversion systems, or WECS, are said to be “one of man’s truly basic machines” (Hunt 1981). The Persians, who are perhaps antiquity’s best-known harnessers of the wind, began using wind power around 500 BCE, and by 700 CE had vertical-shaft windmills, or *panemones*, powering their grain-grinding stones (Park 1981). Reeds were placed across the slats of a wooden frame, which became one of several vertical paddles that spun around a central axis. Walls were built around the apparatus, engineered to ensure the system consistently spun in the desired direction (“Oldest” 2010). Many Middle Eastern civilizations had also appropriated windmill technology by this time.

It is often assumed that Crusaders returning to Europe in the 12th and 13th centuries CE brought the concept of the windmill with them, but due to the markedly different design of early European windmills, it is not completely certain whether they were inspired by Middle Eastern genius or developed independently

(Park 1981). In any case, it was the Dutch who first came up with the horizontal-shaft windmill (the kind most of us probably imagine when we hear ‘windmill,’ typically having four sails oriented vertically), and used it to pump water, grind grain and operate sawmills throughout the Medieval Period (Park 1981). Writing on the use of wind and water mills in this period, Walton (2006) states, “In the pre-industrial era (and even for a good portion of the era of modern factory production) mills were everywhere: they ground grain, sawed lumber, fulled cloth, pulped paper, pressed cider and olives, and incorporated gunpowder.”

In 1887, Professor James Blythe of Anderson’s College in Glasgow (now Strathclyde University) built the first windmill intended for electricity generation (Nixon 2008). The following is an excerpt from his May 2, 1888 address to the Royal Philosophical Society of Glasgow on his experiment:

“In common, I daresay, with many other persons, I have felt, for some time past, that the power of the wind was not sufficiently taken advantage of for the purpose of generating and storing electrical energy; and, in the course of last summer, I determined to make some experiments to test the point in a practical way. These consisted in the erection of a small windmill for supplying electric light by means of storage cells, to a small cottage in the village of Marykirk, Kincardineshire, where I usually spend my summer holiday.

The mill was finished and working about the end of July, 1887... One day last summer, when a good breeze was blowing, I stored as much in half a day as gave me light for four evenings, about three of four hours each time” (Blythe 1888).

Across the Atlantic, professor and inventor Charles Brush was not far behind in wind dynamo development in the United States (Nixon 2008). Wind technology played an important role in the development of rural areas of U.S. prior to the 1930s, when the Rural Electrification Act provided farmers with cheap and convenient electricity (Hunt 1981). Back in Europe, Denmark had established enough wind dynamos by World War II to carry the country through the fuel shortage caused by the Nazi occupation (Inglis 1978). Following the war, the English experimented with a variety of wind dynamo designs and gave serious consideration to increasing the nation’s dependence on wind power, eventually choosing nuclear as their major alternative energy source (Inglis 1978). Germany and France also tested innovative wind power technologies, but then-cheap fossil fuels quickly crippled the wind power market (Park 1981).

Economic hardship also led to the end of one of America’s most memorable wind machines, the Smith-Putnam, built in Vermont during the 1940s. Running with two 175-foot blades, the machine delivered 1500 kW to the Vermont power grid, but only for a short while – when high winds broke one of the 8-tonne blades and wartime resource scarcity prevented its repair, the project was brought to an end

(Park 1981). In the early 1970s, the spike in fossil fuel prices resultant of the Mideast Oil Crisis created a demand for sustainable, alternative energy sources. The American government swiftly began funding research and development in wind power, and in 1980 the first wind farm, complete with 20 turbines, was erected at New Hampshire's Crotched Mountain. It was quickly found to be a failed project – the wind turbines broke down and the wind resource had been overestimated (Nixon 2008). California continued wind power development in earnest with Danish farms helping to supply the boom, but wind power development in the U.S. eventually suffered due to a lack of national supply network (Walz 2009). There were also other reasons, such as America's post-war (particularly vested governmental) interest in nuclear energy possibilities (Inglis 1978).

Wind power development in Europe has traditionally seen a much more viable market ("Global" 2010). In 1991, Denmark erected the first offshore wind farm with 11 turbines. In the same year, the UK built its first onshore wind farm with 10 turbines. These farms are still functioning today (Nixon 2008). In 2009, 10.5 GW worth of wind turbines were installed in Europe, with Spain leading (2.5 GW) and Germany following close behind (1.9 GW). Italy, France and the UK each added more than 1 GW of new wind capacity ("Global" 2010).

Wind power continues to grow around the world as an alternative energy source to fossil fuels. In one sense, we can understand our wind power technology as modern – anyone gazing on acres of turbine-flecked landscape would say so. But the history of wind power conversion shows us that it is hardly new. It is amazing that wind power has not been rendered obsolete with modernity and, given the nature and scope of our present energy issues, some might say it is more relevant now than it has ever been.

Source: <http://www.sassweb.ca/3bb3/volume1-0/features-volume1-0/a-brief-history-of-wind-power>