

ON THE BOOKSHELF

The GRID: The Fraying Wires Between Americans and Our Energy Future

By Gretchen Bakke (Bloomsbury)

The United States was an innovator in the generation and availability of electrical power. The Direct Current system promoted by Thomas Edison and Alternating Current System promoted by Nikola Tesla changed the way Americans lived in the latter part of the 19th and the beginning of the 20th centuries. A national grid was developed (or actually two enormous grids for east and west coasts, and one large grid, for Texas.) The man who basically turned electrical generation in a massive industry was Samuel Insull. He created the kind of monopoly like US Steel or Standard Oil.

America's incredible electrical grid was a magnificent achievement that offered reliable service in a very democratic manner in the 20th century. Our energy needs are different in the 21st century, and the manner of generating electrical power has changed, as well. Solar and wind power are providing larger percentages of electrical power generation each year, which saves on "fossil fuels" and avoids producing pollutants. But no system is perfect. Solar works great when the sun is shining, and wind power works great when the breezes blow, but we rely on electrical power to be available consistently. With few exceptions, that is still best produced by burning oil or coal.

The problem is storage. We need to be able to take all that wonderful power generated by Solar, Wind, and Water, and store it for the time when the sun isn't shining and the wind isn't blowing. Innovation is the key once again. For example, in McIntosh, Alabama, electrical power is generated during the day by renewables, and the excess is used to condense air and force it into the nearby massive salt caverns that stretch from north of Mobile across southern Mississippi. This is released when needed to spin a turbine to regenerate an electric current. Compressed air is a 24-hour cycle, and it's been working since 1991. This book tells of other creative solutions.

The author, an experienced researcher in the field, admits, "There are thus three problems of different kinds that meet at the grid and get stuck there: How to deal with the combined interests of many different players; How to deal with the legacy technology, the grid we've got; and how to deal with the fact that's made and run by humans." Part of the solution is to build and design places, things, and machines that are more energy-efficient; the other is to create a massive series of mini-grids that can operate a home or a factory but don't necessarily rely on a massive national grid.