



TRANSFORMATIVE HISTORICAL INFRASTRUCTURES: THE CASE OF ELECTRIFICATION

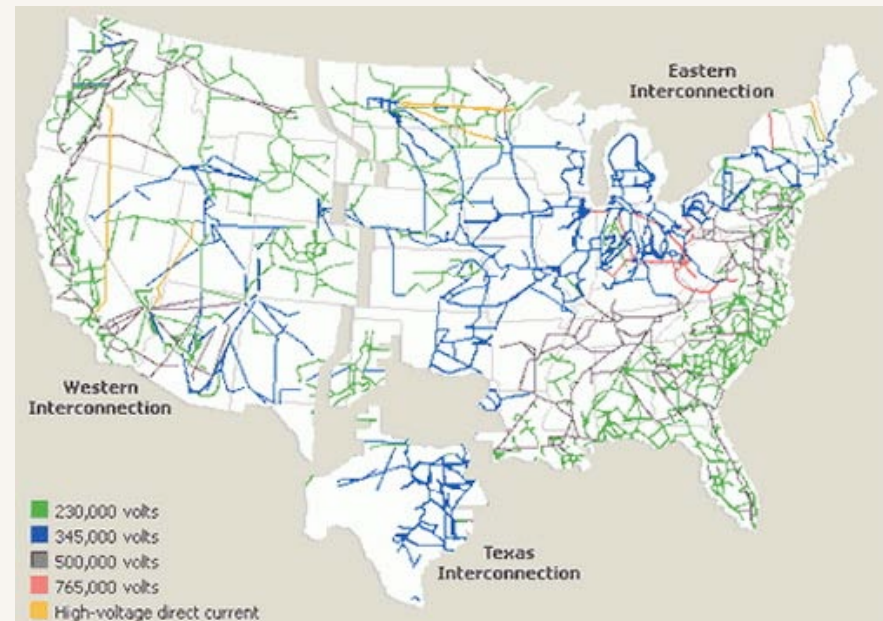
Overview

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- Early Electrification
- Rural Electrification and the New Deal
- Economic Impact
- Social Impact
- Environmental Impact
- Current RUS

Early Electrification

- The first electrically powered businesses and homes in the 1880's generated and maintained their own power.
- Investor-owned utilities (IOUs) improved generating technologies and achieved economies of scale.
- Regional power companies eventually linked the local systems into a national power grid.



Rural Electrification

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- Early electrification was highly concentrated in the cities.
- IOUs determined rural electrification would be unprofitable:
 - Line extension costs of \$1,500- \$2,500 a mile
 - Low density areas
 - Low per capita demand
 - Consumers would not be able to afford wiring or rates
- Only 10% of farms electrified by 1935.



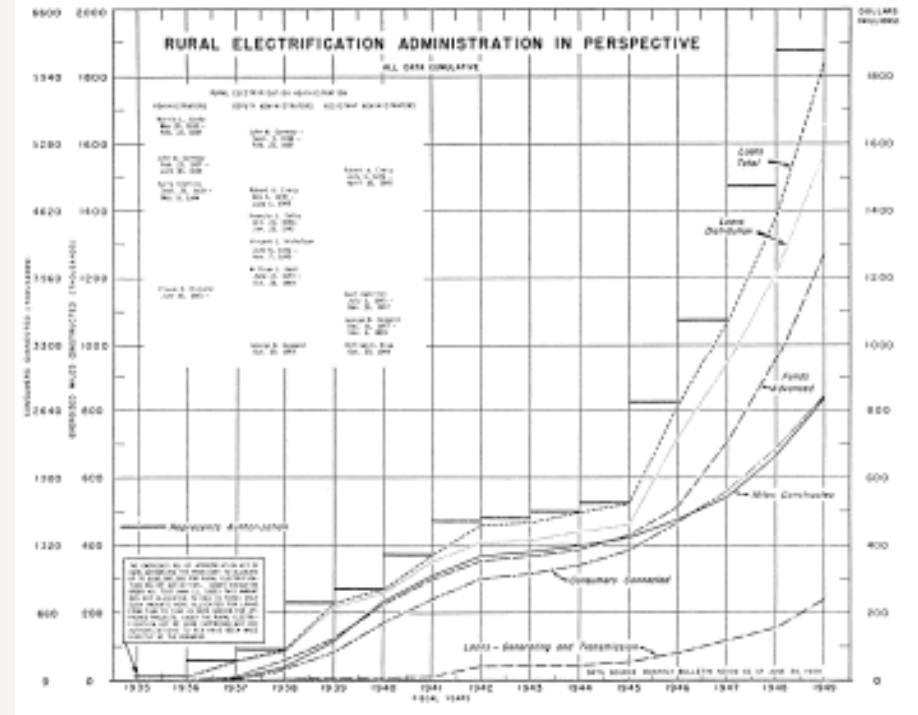
Old Pelkey Farm
Fox Farms Rd.

Figure 2: Farm in the early 20th century
(<http://www.wilmingtonhistoricalsociety.org/Images/Old%20Pelkey%20farm,%20Fox%20farm%20Road,%20ca.%201900.jpg>)

Rural Electrification Administration and the New Deal

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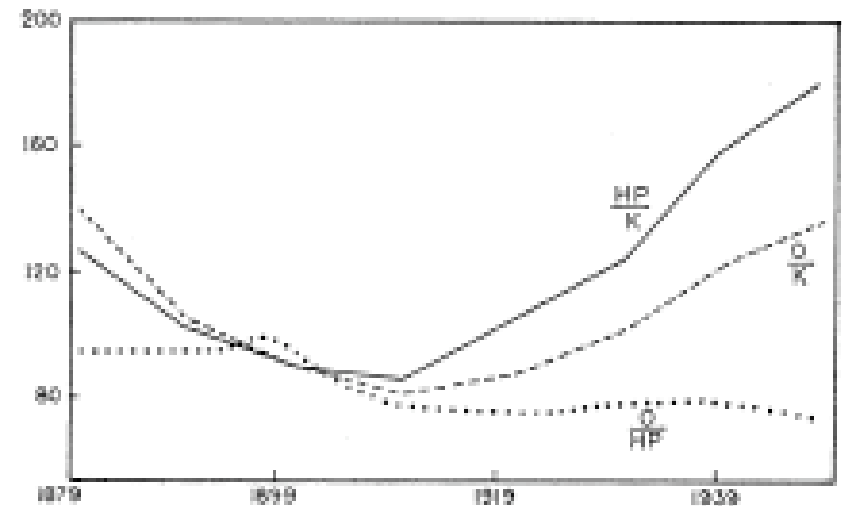
- **President Franklin D. Roosevelt established by Executive Order 7037 May, 11, 1935**
- **\$100,000,000 the first year for low-interest loans to public interests for rural electrification.**
- **REA engineers designed new low cost lines suitable for rural extensions that lowered costs to below \$1,000 a mile**
- **IOUs began to compete with the electric cooperatives significantly increasing the rate of rural electrification**
- **90.8% of farms were electrified by 1953**



Economic Impact

- Improved Production
 - ▣ Greater output per unit of capital by replacing capital intensive steam systems with electric power.
 - ▣ Assembly line
 - ▣ Electric Irrigation pumps for agriculture
- New Industries
- Increased Commerce
- REA as Work-Relief Program

Manufacturing: Output-Horsepower Capacity, Horsepower-Capital, and Output-Capital Ratios for 20-Year Overlapping Periods, 1879-1949 (Index Numbers: 1899 = 100)



Sources: Horsepower (HP), see Table 1; output (O) and capital (K), John W. Kendrick, *Productivity Trends in the United States* (Princeton: University Press, 1961), pp. 464-466.

Social Impacts

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- New appliances eased domestic labor for housewives
 - ▣ Refrigerators, vacuum cleaners, washing machines, irons, mixers and fans, etc.
- Promoted education and increased literacy
- Improved hygiene and health
- Facilitated urban deconcentration
- Pattern of dispersed privacy
- Improved communication



Above: REA; "Woman plunges and scrubs"

Below: REA; "Woman places log in stove" (Franklin D. Roosevelt Library & Museum)



Environmental Impacts

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- **Depends highly on the primary source of electricity**
 - ▣ Natural Gas
 - ▣ Coal
 - ▣ Oil
 - ▣ Nuclear Energy
 - ▣ Municipal Solid Waste
 - ▣ Hydroelectricity
 - ▣ Non-Hydroelectric Renewable Energy
- Clearing for distribution lines
- USDA Rural Utilities Services (RUS)
 - ▣ NEPA



Figure 6 Above: Southern Co's Plant Scherer; a coal fired plant

Figure 7 Below: Wind farm in South Australia



More Current RUS

- Telephone, drinking water, waste disposal loans and grants to communities under 10,000 people
- USDA Rural Development Broadband Program increased with stimulus money
- RUS decreasing environmental impact
 - ▣ March 2008 suspended new low-interest loans to build coal fired power plants
 - ▣ Increasing loans available for renewable energy

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