



# THE WIND PTC

## THE HIDDEN COSTS OF WIND POWER

Presentation to: Republican Study Committee

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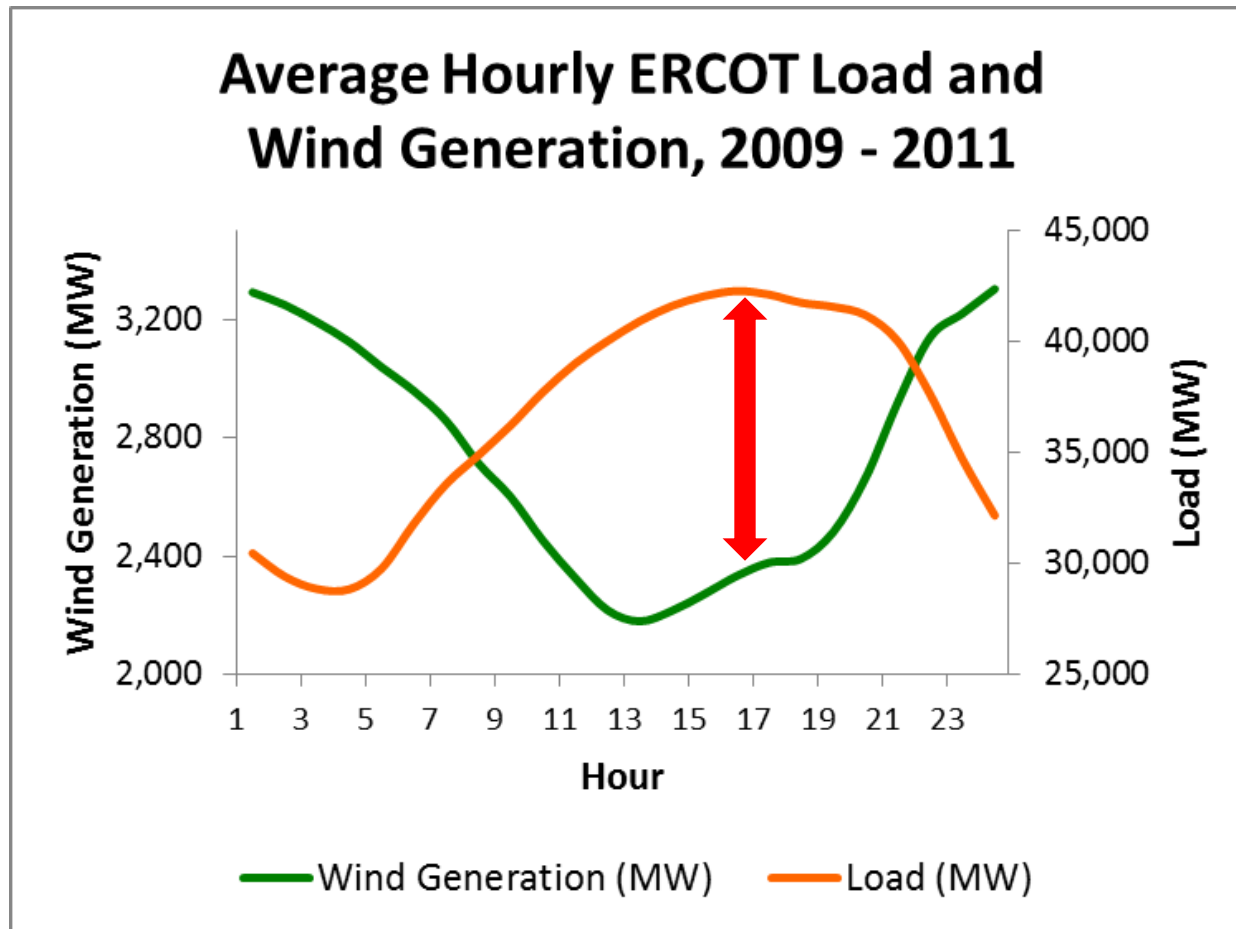
# Electric system operations 101

- Because electricity cannot be stored, supply must match meet demand instantly
- The goal is to do so at the lowest possible cost using different types of generating resources
  - Baseload (nuclear, coal) – runs 24-7. Large units, with high capital costs, but low operating costs
  - Intermediate (natural gas) – runs 20-80% of the time. More costly to operate than baseload units, but lower capital costs
  - Peaking (natural gas) – runs only when demand is highest (<10% of the time). Low capital cost, highest operating cost
- Wind generation makes balancing this mix more difficult
  - Capital and operating costs like baseload generation, but intermittency of wind generation creates big headaches for system operators

# Wind Generation Operation and Planning Issues

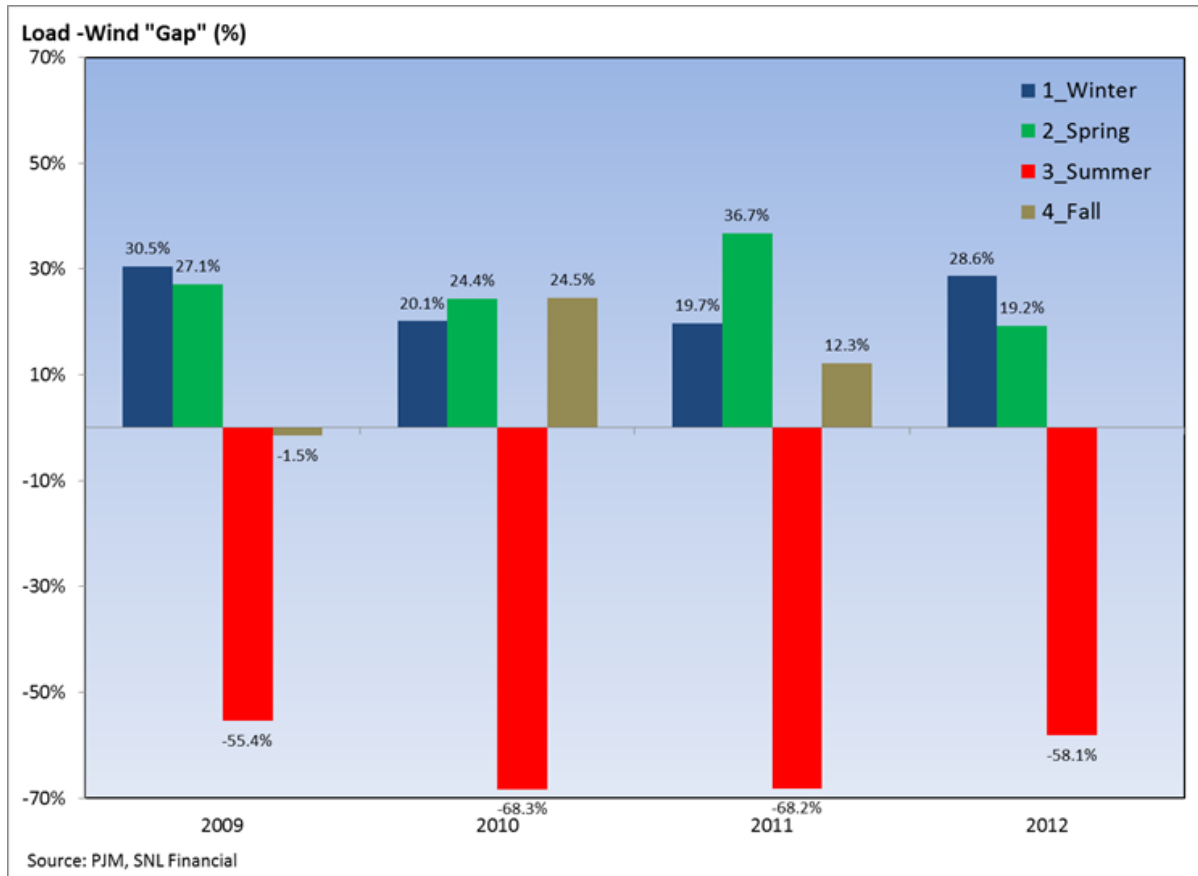
- Two inherent characteristics of wind power raise significant (and costly) planning and operational issues for electric power systems
  - Wind generation is least available when the demand for power is greatest. See J. Lesser, “Wind Power in the Windy City: Not There When Needed,” Energy Tribune, July 25, 2012 (copies available today)
    - (On July 6, electricity demand in the Chicago area peaked at 22,000 MW. 2,700 MW of wind generation installed – 4 (four!) MW of wind power that day, roughly the energy used by 4,000 blow dryers.)
  - Wind generation is intermittent and cannot be scheduled like conventional generating resources. In other words, because the wind does not always blow, it cannot be relied on like conventional resources

# This chart shows the daily pattern of wind generation relative to daily electric demand



Wind tends to blow more at night, when loads are at their lowest level. This means that greater quantities of alternative generation (natural gas) must be ready to generate during the day. ERCOT is the system operator for Texas

# On a seasonal basis, wind is least available in summer when electric demand peaks



We developed the concept of the load-wind “gap.”

In summer, when load is at its highest for the year, wind generation is lowest relative to its average for the year.

# Subsidized wind exacerbates the problem of “negative” wholesale prices

- Negative prices are just what they sound like – if too much power is dumped into the market, suppliers can end up paying!
  - Negative prices arise because it is costly to turn off baseload plants.
  - For example, you cannot just shut off and restart a nuclear plant from hour-to-hour.
- Because wind tends to generate the most when demand is the least, more hours when prices are negative
  - True wholesale competitors see lower prices in all hours, plus see more hours where they must pay to keep their units on.
  - At the same time, the PTC makes it economic for wind generators to keep producing: wind producers make money (off taxpayers) while wholesale competitors lose.

# Subsidized wind generation damages competitive electric markets

- Federal policy to have competitive wholesale electric markets since 1992 (EPAct)
- Subsidized wind can lower prices in the short-run and drive out true competitive firms
  - See J. Lesser, “Gresham’s Law of Green Energy,” Regulation, Winter 2010-2011 (copies available today).
  - Government intervention and subsidies makes it tougher for competitive firms to obtain financing – more financial risk and higher borrowing costs.