

## Integrating Renewables

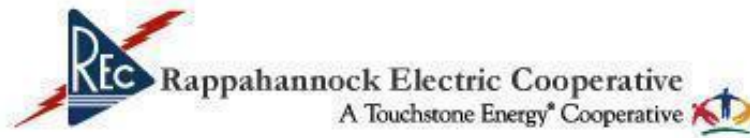


CompuSharp Inc.  
6 December 2010

# CompuSharp

- A high-tech power system solutions company in Silicon Valley
- Specialized in Energy Management, Energy Conservation, Energy Research
- Regulatory Aspects
- Power Systems Analysis:
  - Load Flow, Load profile study
  - Short circuit / Stability studies

# Some of our Clients

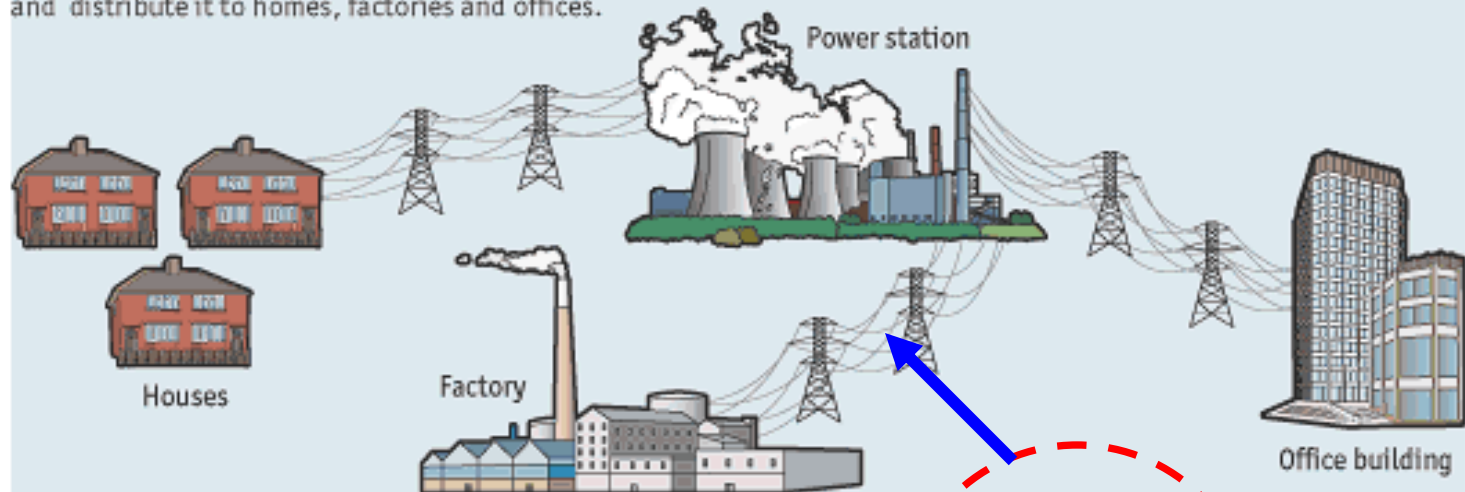


# New Power Grid

Integrate new generation to the existing system

## Conventional electrical grid

Centralised power stations generate electricity and distribute it to homes, factories and offices.



# The Challenges

- Infrastructure for absorption (transmission lines, switch yards, etc.) by Power Transmission Organization (PTO)
- Congestion Issues
- Changes in control and metering devices (e.g. multi-direction load flow management)
- Uncertainties, e.g. weather changes, ramp rates of wind gen.
- Operational issues: Frequency stability, Dynamic VAR

# Operational challenges

- NERC compliance
- Net metering (billing & accounting)
- Telecommunication and local control
- Isolation during emergencies
- Absorbing real-time electricity pricing information

# Our Services

- Technical Feasibility Study
- System Impact Study
- Operational Interconnection Studies
- Congestion Analysis
- System Reliability and NERC Compliance



# Economic Analysis

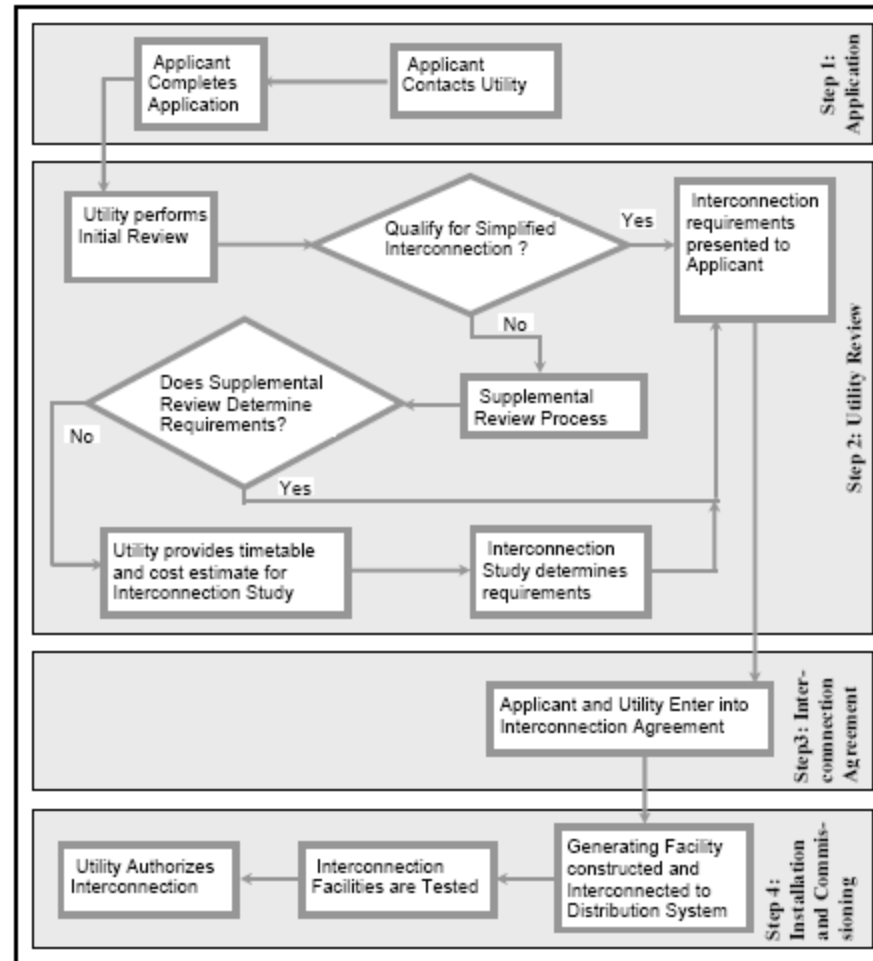
## for New Power Generation

- Production costs estimation for various load and generation levels during different time periods (e.g. winter, summer, weekdays, weekends, etc.)
- Locational Marginal Pricing (LMP)

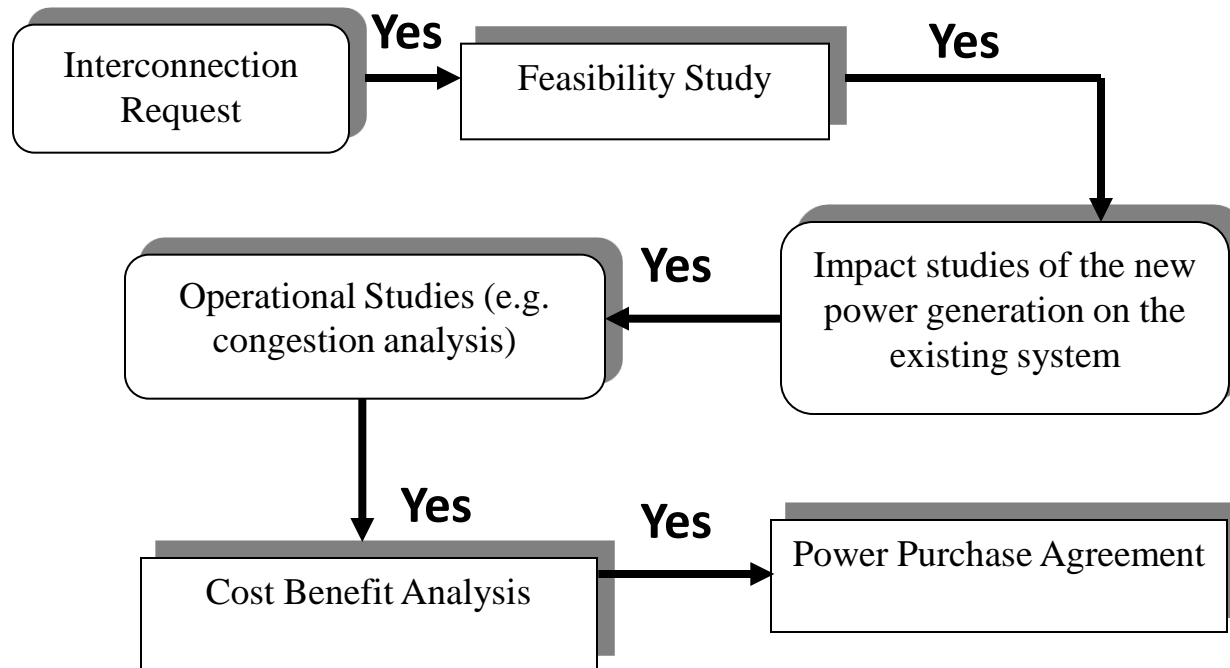
*The objective is to maximize the return rate of your investment!*



# Steps of integrating new power to existing system



# Interconnection Process Flowchart



*All of these steps involve deep knowledge of Power Systems analysis and Regulations*

# Our Methods

- Load flow and short circuit studies
- Congestion management
- Steady and dynamic stability analysis
- Reliability performance assessment
- Cost benefits analysis



# Our Commitment

*Assist the Independent Power Producers (IPP)  
at each step for effective interconnection to  
the existing system*

