ELECTRICITY IN NORTH ST. PAUL

Presentations, videos and policy briefs from PA 5721: Energy and Environmental Policy, Fall 2013
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The Electric Grid

- Generation
- Transmission (Transmission lines, Transmission substation)
- Distribution (Distribution lines, Distribution substation)
- Industrial
- Service
- Residential (Padmount transformer)
Key Actors in the Electricity System

Electric System

Stakeholders

- RTO/ISO
- Generation Utilities
  - NORTH SAINT PAUL Municipal Utility
  - State- PUC, Energy Office (Policies & Planning), Environmental Office (Siting)
  - Industrial, Commercial & Residential Consumers
Ancillary Services Markets
- synchro-phasors
- protective relay operation
- high-frequency switching devices
- dynamic system response (stability)

Energy Markets (Day Ahead and Real-Time)
- AGC signal
- wind and solar output variation
- demand response?
- resolution of most renewables integration models
- service restoration (outages)
- day-ahead scheduling
- hour-ahead scheduling

Capacity Market
- T&D planning
- planning for carbon emission goals

Timescales:
- $10^{-6}$ seconds (millisecond)
- $10^{-3}$ seconds
- $10^0$ seconds (second)
- $10^1$ seconds (minute)
- $10^3$ hours
- $10^6$ days
- $10^9$ years
What is North St. Paul doing NOW?

- **ENERGY EFFICIENCY**:  
  - Rebates  
  - Lighting  
  - Appliances  
  - Renovations

- **RENEWABLE ENERGY**  
  - Wind Power  
    - Wind Power sourcing  
    - 160 kW Wind turbine

- **COLLABORATIONS**  
  - Green Step Cities  
    - Efficient Existing Public Buildings (B3)  
    - Efficient Existing Private Buildings (Marketing)  
    - Efficient Outdoor Lighting  
    - Renewable Energy
Today’s Presentations

- Energy Efficiency
- Smart Meters
- Demand Side Management (DSM)
- Distributed Generation (DG)
- Net Zero
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• Smart Meters
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• Smart meters;  
  http://www.youtube.com/watch?v=HJJ5wd42q9A&feature=youtu.be