



# Strategist Basics

Minnesota Office of  
Energy Security



# Strategist Graphically



# Overview of Strategist Inputs (1)

- System data—discount rates, taxes, etc.
- Forecast data
  - Energy and demand
  - Monthly with typical week
  - Conservation and load management impacts
- Existing generation—thermal, wind, PPAs, etc.
  - Fixed costs (O&M)
  - Variable costs (fuel, O&M)
  - Capacity, heat rates, fuel used, retirement, etc.

# Overview of Strategist Inputs (2)

- Expansion alternatives
  - Capacity, fuel used, heat rates, lifetime, etc.
  - Availability: how many units each year
  - Costs: same as existing plus capital costs
- DSM can be considered by the model
  - As a separate unit
  - As a forecast adjustment

# Summary of Strategist Inputs

- In summary—lots of data required
  - Engineering
  - Accounting
  - Economic
- OES is not able to create a database in a reasonable time-frame
  - Time required
  - Data is only available at utility

# Overview of Strategist Operation (1)

- Uses sound mathematical theory (dynamic programming)
  - Tracks all feasible plans within memory limits
  - Must take care not to create too many feasible plans
- Very flexible operation
  - Relatively easy to create new scenarios using existing database
  - Scenarios can explore many futures

## Overview of Strategist Operation (2)

- Can ask model to consider:
  - Utility costs or societal costs
  - Any time period (up to 40 years)
- Running time varies greatly
  - Shortest—as little 45 minutes
  - Longest—nearly 1 week
  - Typical—between 1 day and 1 hour

# Overview of Outputs (1)

- Detailed data provided for one plan
  - Can ask that detailed data be produced for any single plan (usually the best plan)
  - Data is available at system or unit level
  - Emissions tons and cost,
  - System costs--fuel, O&M, capital, etc.

## Overview of Outputs (2)

- Tracks all feasible expansion plans
  - Units added tracked and reported
  - By default does not report costs, unit output, etc for non-least cost plans

## Overview of Outputs (3)

- Outputs typically reviewed include:
  - New expansion units added
  - Operation of key existing/expansion units
  - Non-least cost expansion plans & cost difference
  - Annual fuel usage
  - Market purchases/sales
  - Excess 'dump' energy

# Summary of Operation

- As much or more time needed to review inputs as to run scenarios
- Most likely, any data you might want is available
- Is a planning tool, not a 'how to operate the system' tool

# Office Analysis Process (1)

- Obtain base case file, changes to base case for scenarios, and preferred case file from utility
- Run model on base and preferred cases to ensure outputs match (we have the correct file)
- Review inputs of utility base case

## Office Analysis Process (2)

- Develop new base case based upon needed changes
  - Input errors (coordinated with utility)
  - Wrong constraints
  - Difference of opinion with utility
- Run scenarios of interest using new base case

## Office Analysis Process (3)

- From scenarios assemble preferred case
- Use preferred case and run final contingency scenarios
  - High and low externalities