

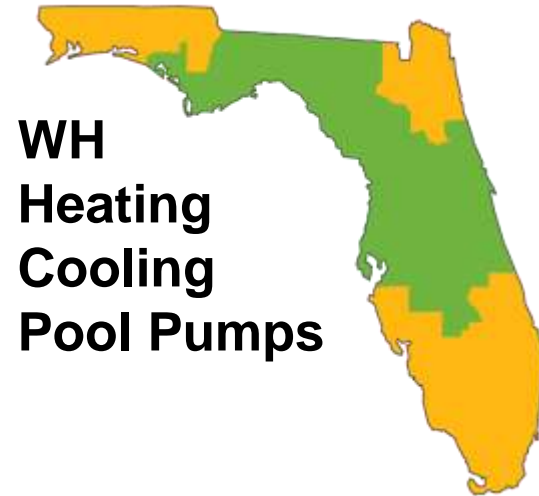
# Cost-Effectiveness Testing for DR Resources:

## Principles and Practice

# Progress Energy DR Programs

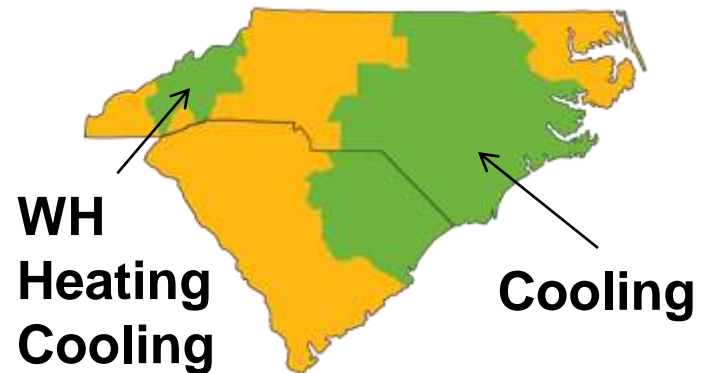
## Progress Energy Florida

- ◆ **EnergyWise Home**
  - 400,000 Participants
  - 660 MW
- ◆ **C/I Standby Generation** – 95 MW
- ◆ **Interruptible** – 270 MW
- ◆ **Voltage Reduction** – 110 MW



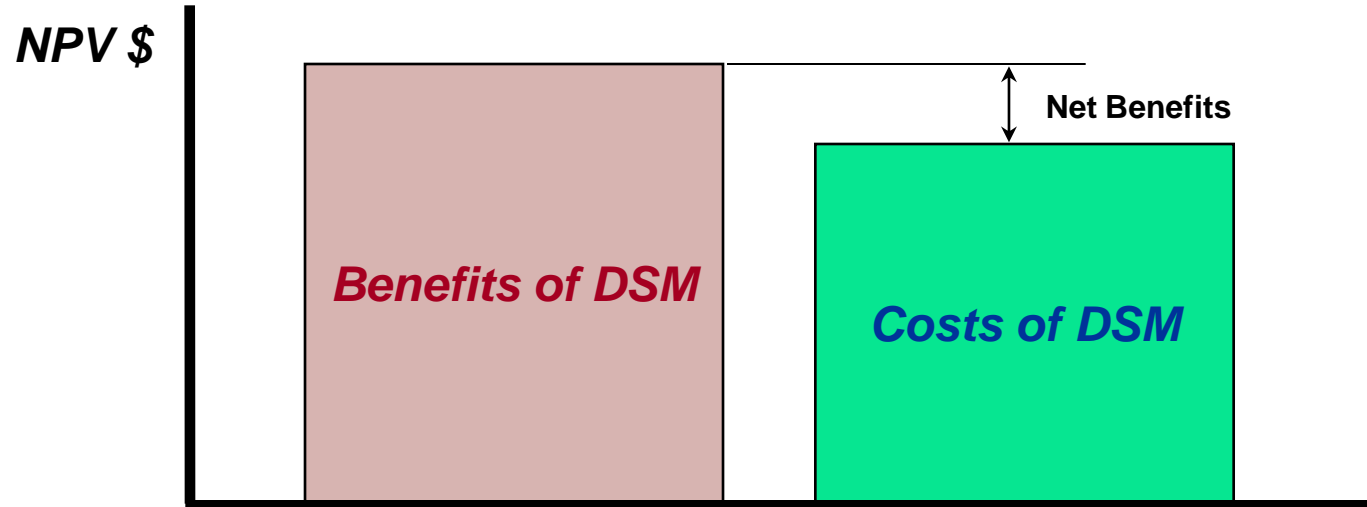
## Progress Energy Carolinas

- ◆ **EnergyWise Home**
  - 65,000 Participants
  - 75 MW
- ◆ **C/I Demand Response** – 13 MW
- ◆ **Interruptible** – 275 MW
- ◆ **Voltage Reduction** – 175 MW



# DSM Cost-Effectiveness

- A benefit-cost analysis that compares the long-term benefits & costs of a DSM program
- A program is deemed cost-effective if the NPV of program benefits exceed the NPV costs over the life of the program



# DSM Cost-Effectiveness

- The analysis is dependent upon your perspective
  - ◆ **Participant Test** – DSM Program Participants
  - ◆ **Rate Impact Measure (RIM) Test** – Non-participating Customers
  - ◆ **Total Resource Cost (TRC) Test** – All customers as a whole
    - Sum of Participant and RIM Tests
  - ◆ **Utility Cost Test** – A Utility spending perspective
    - Renamed the Program Administrator Cost Test
  - ◆ **Societal Test** – All of Society as a whole
- Florida requires evaluating the first three tests
- NC/SC requires the first four tests

# Participant Test

NPV \$

## Benefits of DSM



## Costs of DSM



# Cost-Effectiveness Modeling

- RIM, TRC, UC and Societal tests all evaluate DSM programs relative to the alternative of serving future load growth
- A benefit/cost ratio  $> 1.0$  means DSM is more cost-effective than building supply-side resources
- Net savings (i.e., net of free-riders) are used in all tests except the Participant test
- **Gather All Relevant Program Data**

## Costs

- ◆ Program Costs
- ◆ Participant Costs, if any
- ◆ Participant Incentives

## Participation

- ◆ Number of Additions
- ◆ Number of Cancellations
- ◆ Non-Response Rates

## Savings

- ◆ Peak kW demand savings
- ◆ Hourly savings shape
- ◆ Snapback Assumptions

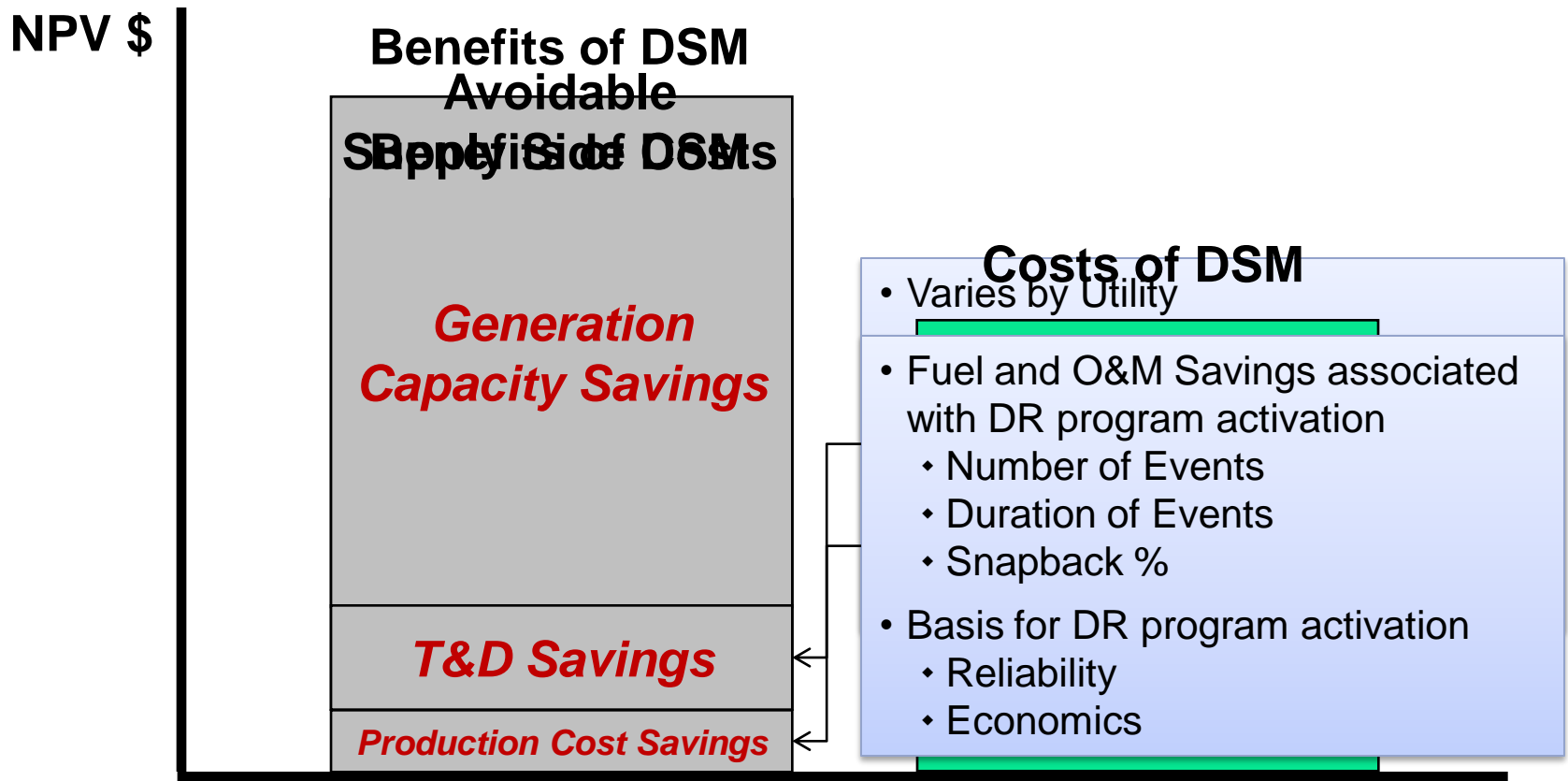
## Dispatch Characteristics

- ◆ Number of events, hours
- ◆ Dispatch price
- ◆ Dispatch priority

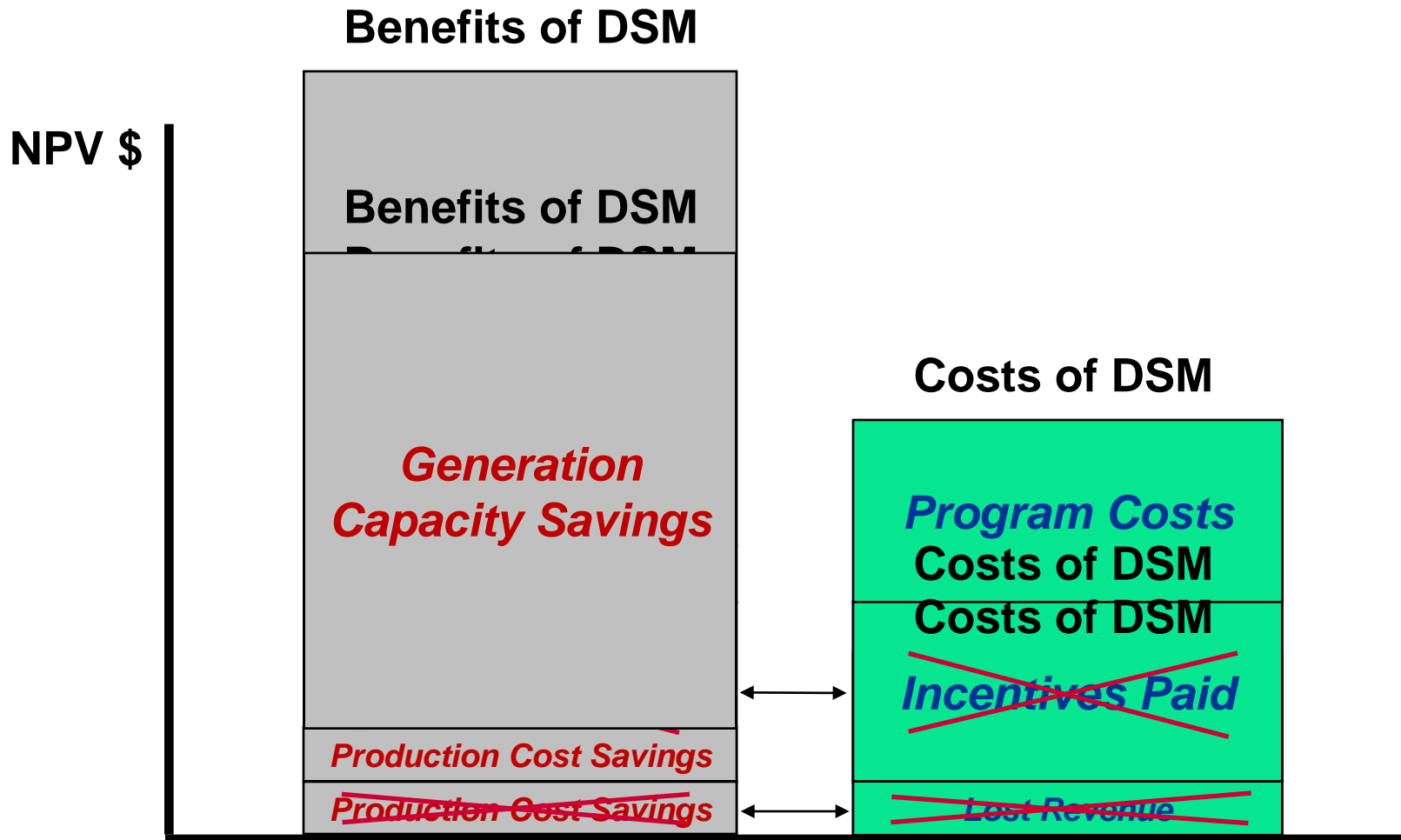
# Cost Effectiveness Modeling

- Strategist – An integrated resource planning model is used to perform the DSM cost-effectiveness evaluations
  - ◆ Same model used by Resource Planning
  - ◆ A production cost simulation of the system with and without the DSM program is performed to compute fuel and O&M savings
  - ◆ Deferred generation capacity costs are based on:
    - The peaker methodology in the Carolinas
    - The next avoidable unit in Florida
- All non-program data is consistent with the company's:
  - ◆ Resource Plan
  - ◆ Generating unit characteristics
  - ◆ Load forecast
  - ◆ Fuel price projections
  - ◆ Financial assumptions

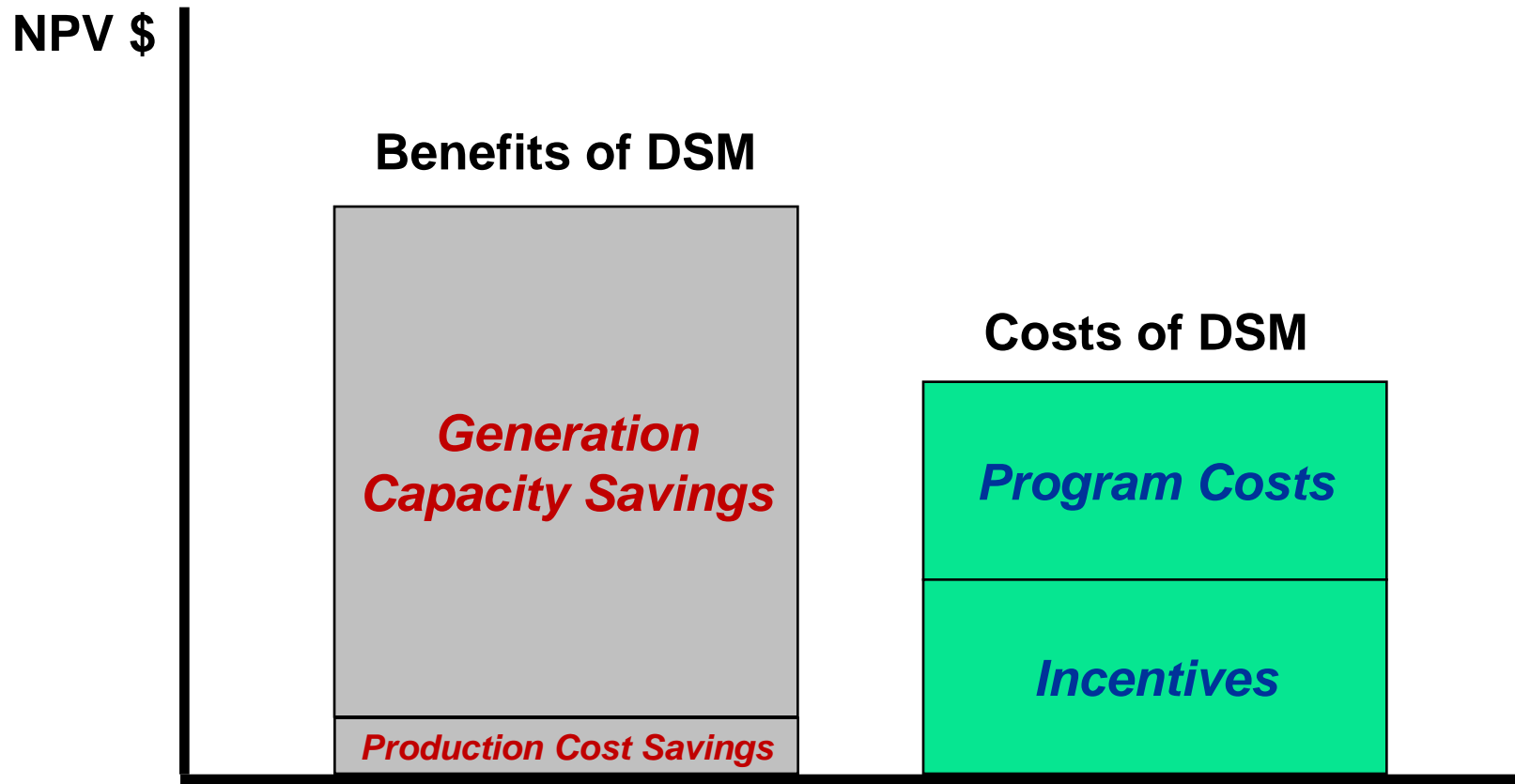
# Rate Impact Measure (RIM) Test



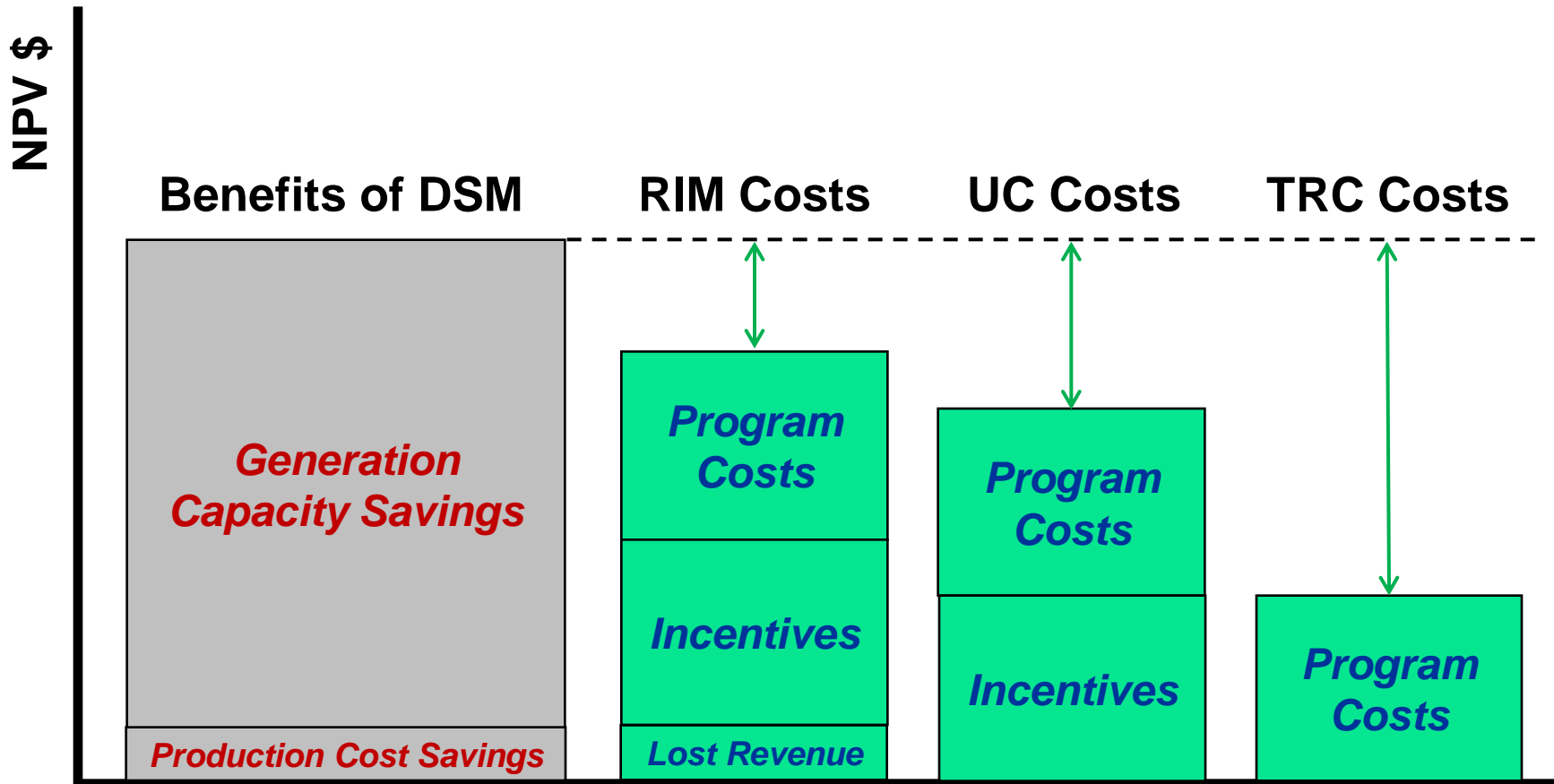
# Total Resource Cost (TRC) Test



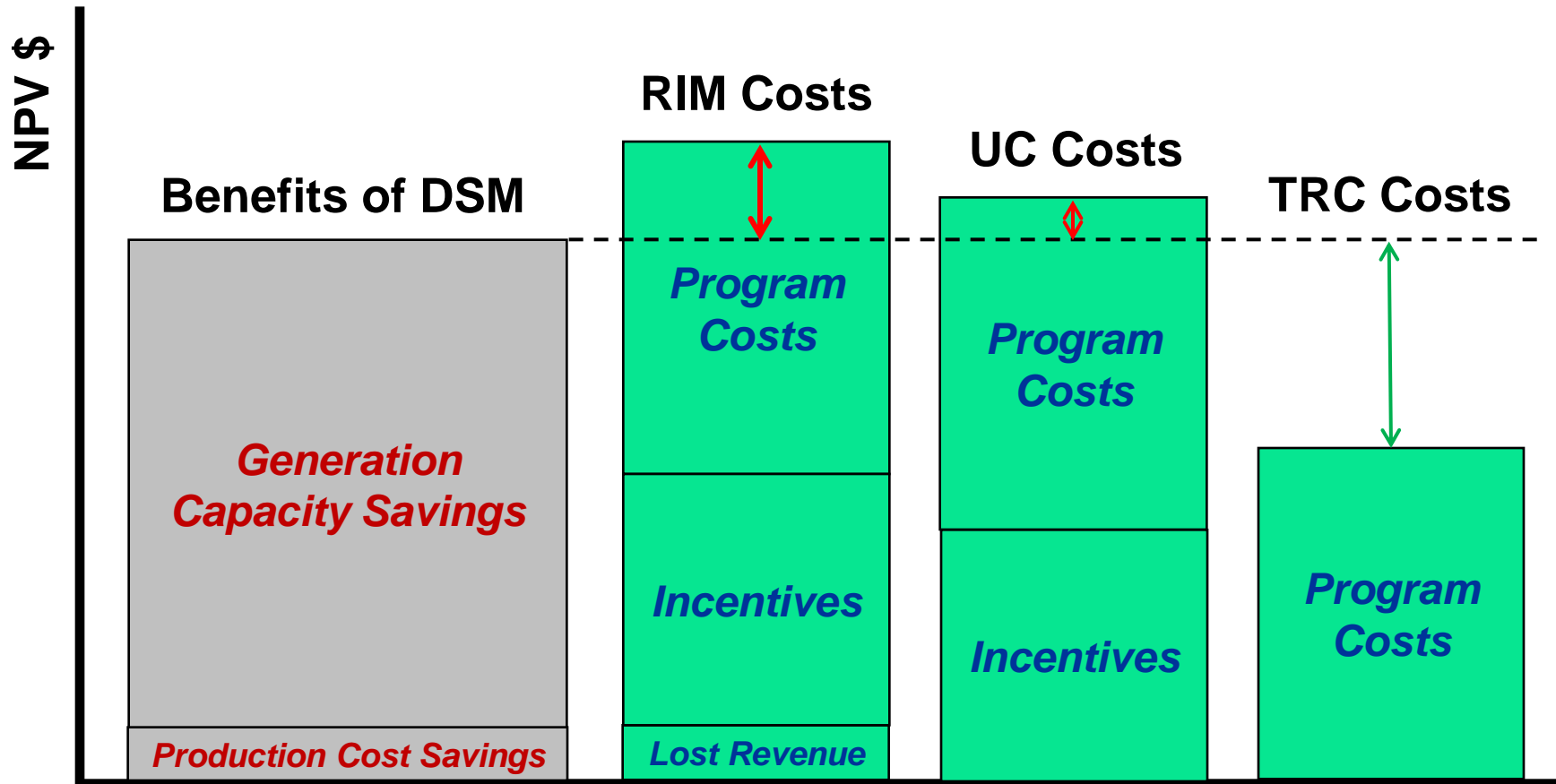
# Utility Cost (UC) Test



# Cost Effectiveness – DR Example



# Cost Effectiveness – DR Example



# Cost Effectiveness Issues

- Cost Effectiveness screening tests can provide support for building a DR program, but not necessarily how much to build or how to use it
  - ◆ How much DR is too much?
  - ◆ Plan how to use the program, and use it as planned
    - Reliability Dispatch
    - Economic Dispatch
  - ◆ Balance program use with customer satisfaction
    - Or risk losing program benefits due to customer drop-outs

# Questions?