RISK ASSESSMENT

Method and Results

for the

Geothermal Technology Program

U.S. Department of Energy

July 2006
Washington, D.C.

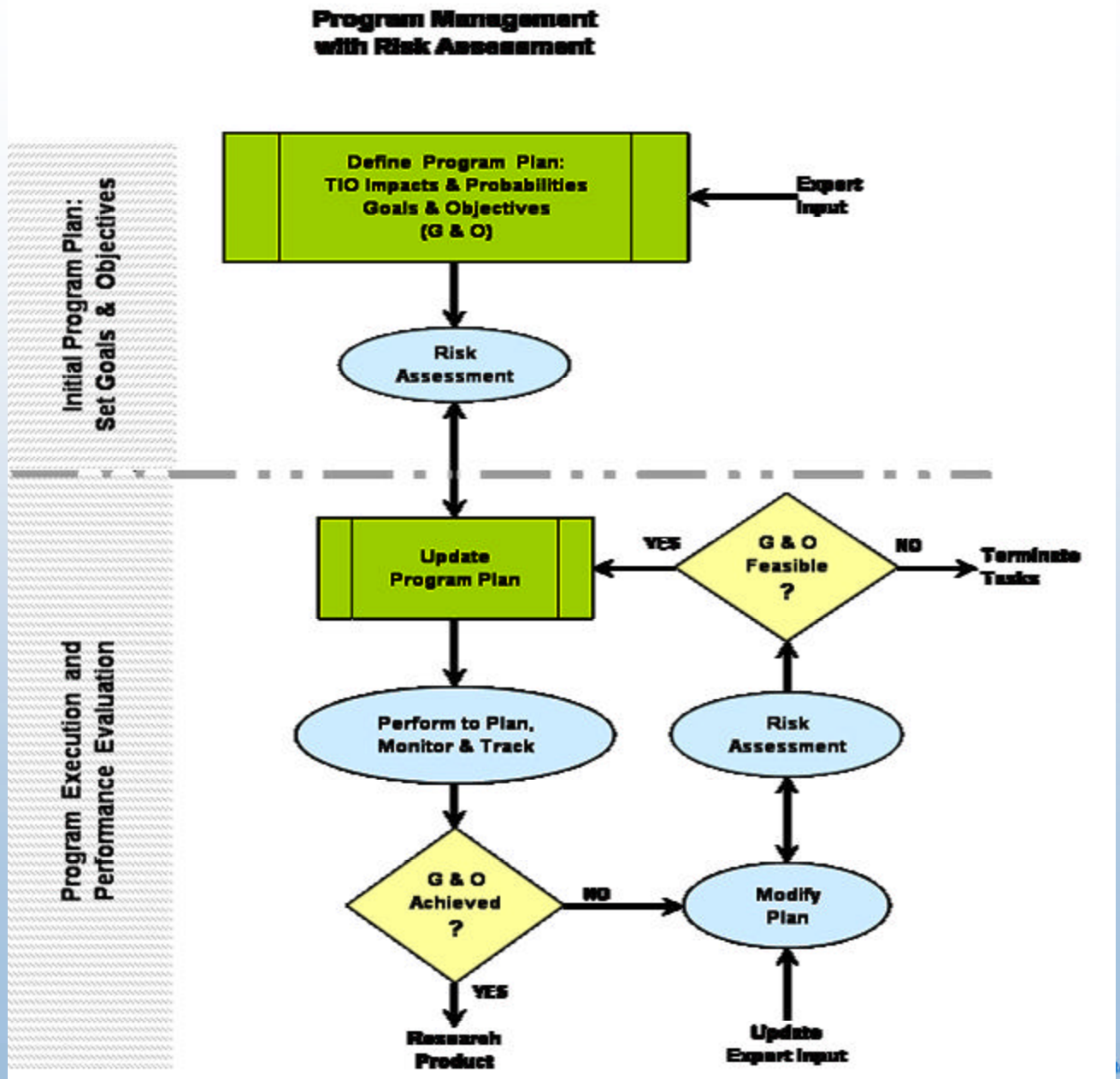
Purpose and Benefits of Risk Assessment

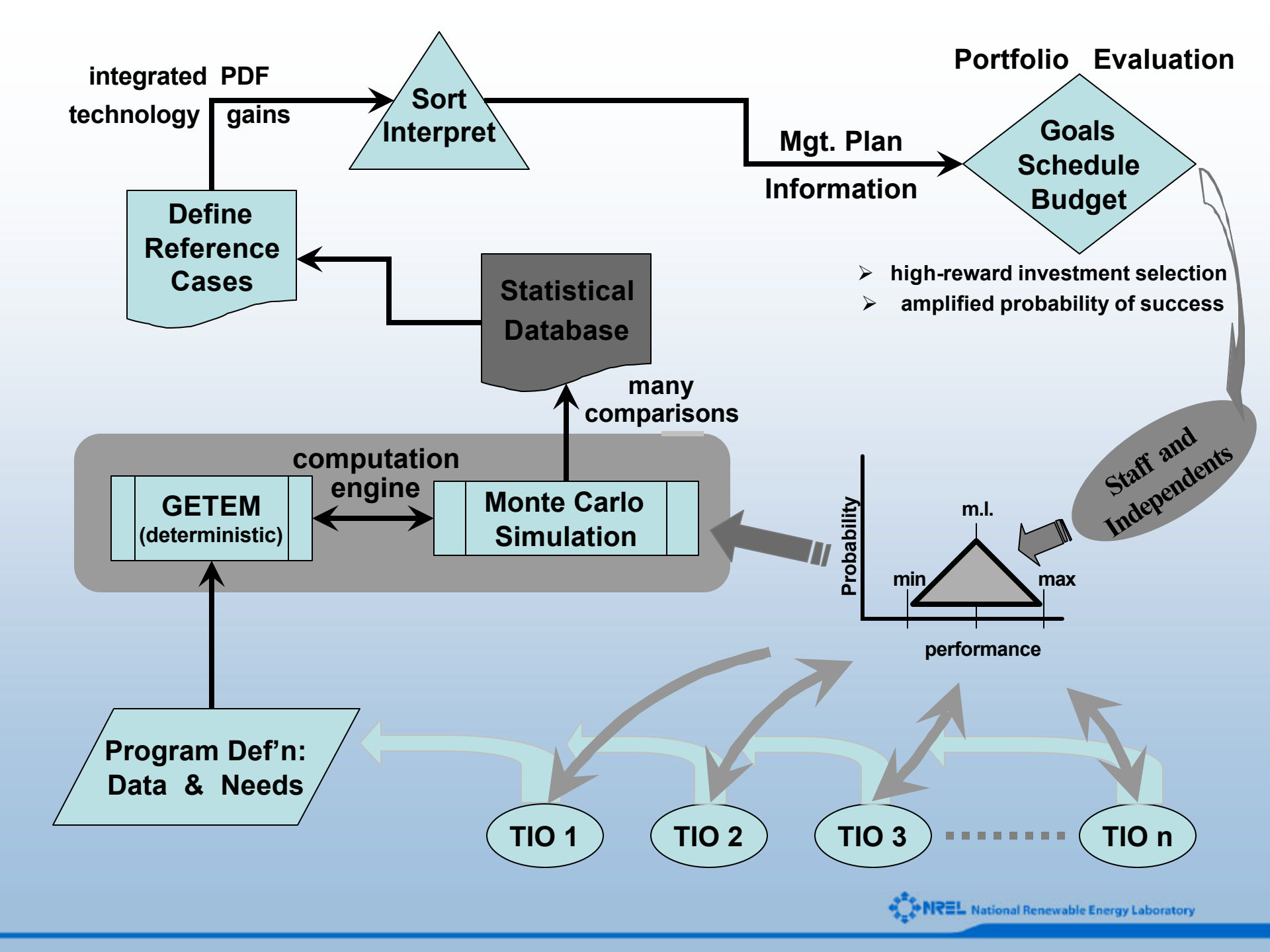
Purpose:

- **Better Metrics**
- **Better View**
- **Consistent Evaluation**

Benefits:

- **Better goals and plans**
- **Adjust plans based on work tracking**
- **Quantitative ranking of alternatives**
- **Value of the Program**

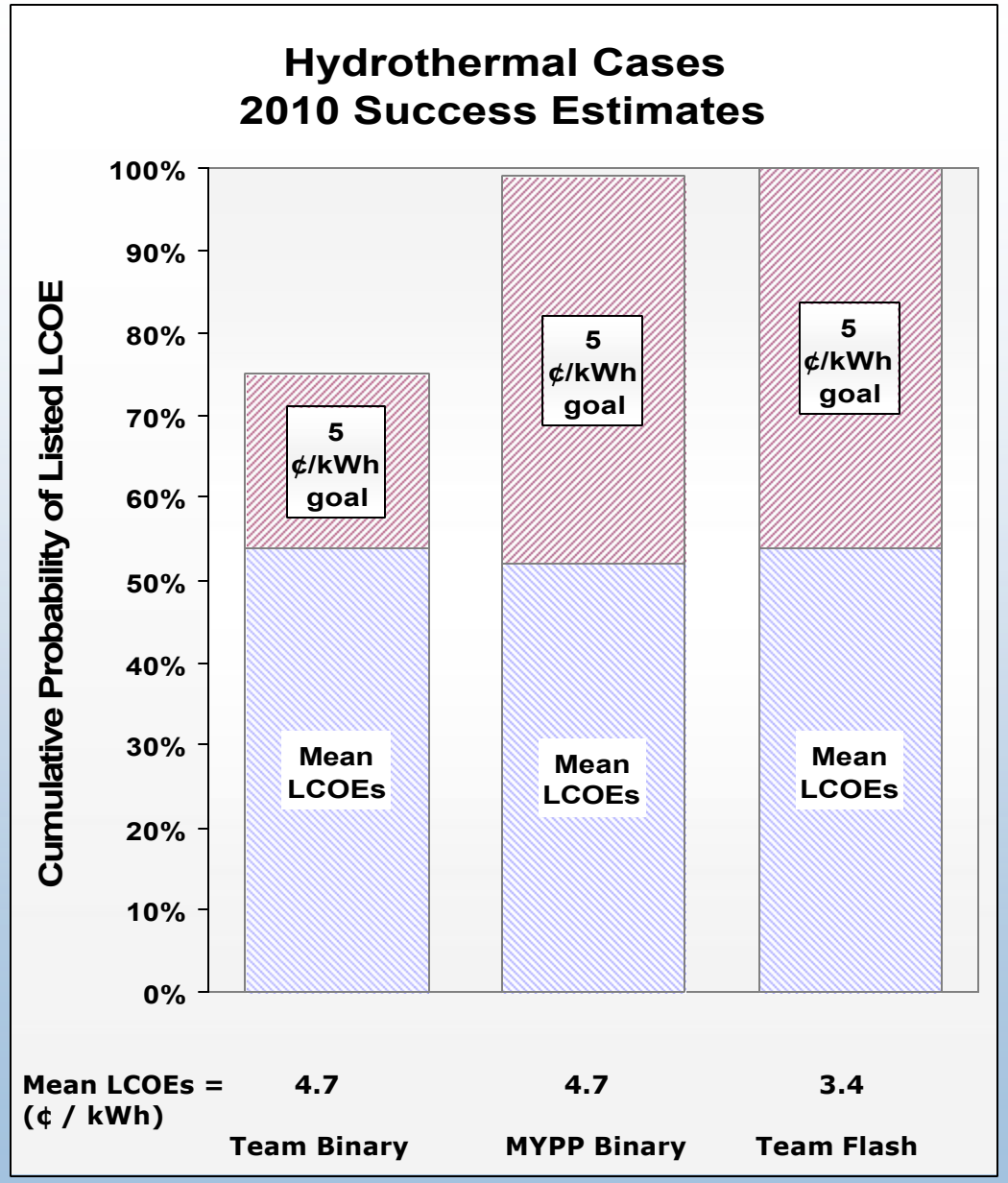

Program Management
with Risk Assessment
Initial Program Plan:
Set Goals & Objectives
Define Program Plan:
TIO Impacts & Probabilities
Goals & Objectives
(G & O)
Expert
Input
Risk
Assessment
Update
Program Plan
YES
G & O
Feasible
?
NO
Terminate
Tasks
Program Execution and
Performance Evaluation
Perform to Plan,
Monitor & Track
Risk
Assessment
G & O
Achieved
?
NO
Modify
Plan
YES
Research
Product
Update
Expert Input


integrated PDF technology gains
Sort Interpret
Portfolio Evaluation
Mgt. Plan Information
Goals Schedule Budget
Define Reference Cases
Statistical Database
high-reward investment selection
amplified probability of success
many comparisons
computation engine
GETEM (deterministic)
Monte Carlo Simulation
Staff and Independents
Probability
m.l.
min
max
performance
Program Def'n: Data & Needs
TIO 1
TIO 2
TIO 3
TIO n

Results Summary

Hydrothermal Cases
2010 MYPP Goals

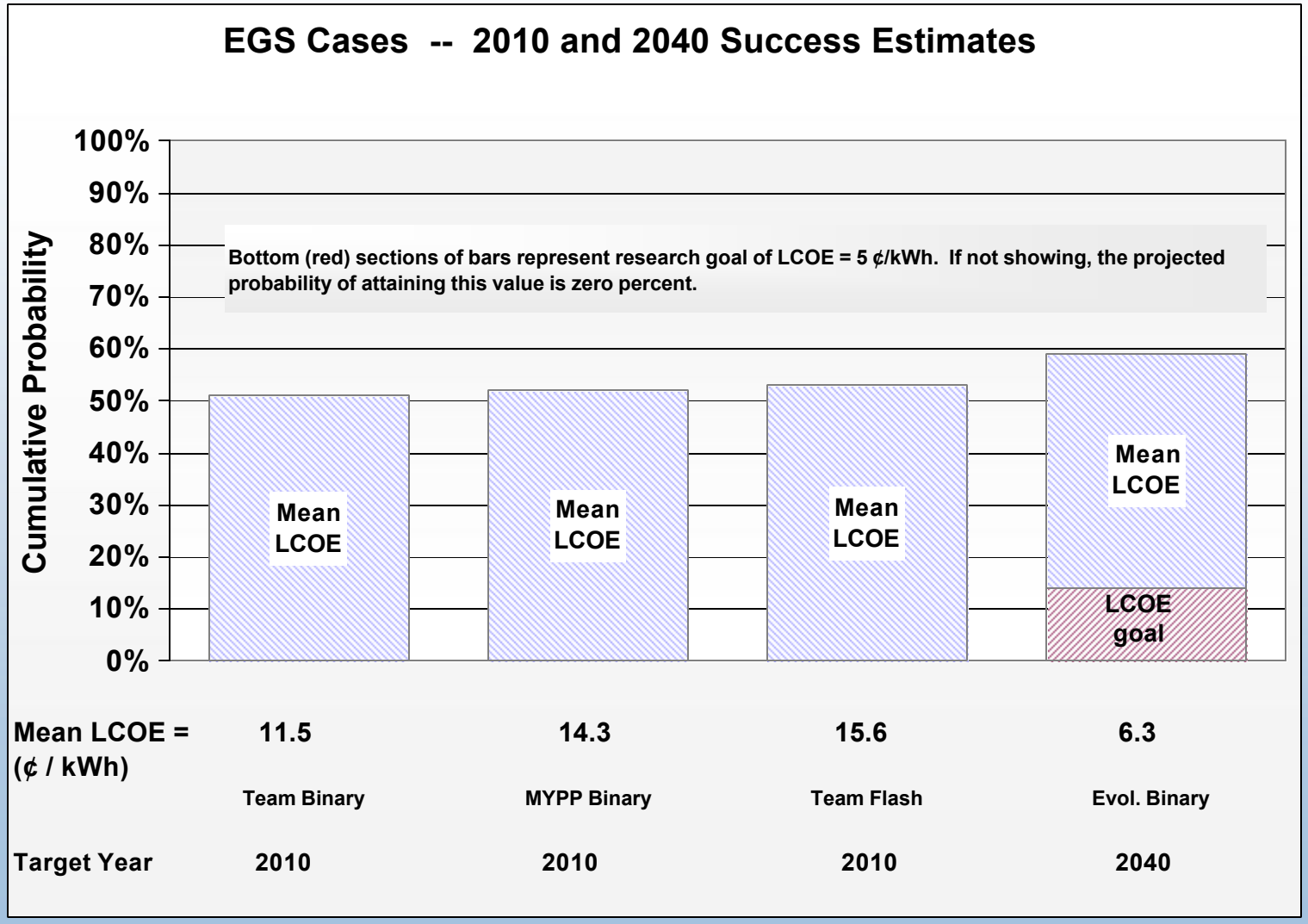
Statistical assessment builds a data-base that can break out probability conditions to prioritize decisions toward success.



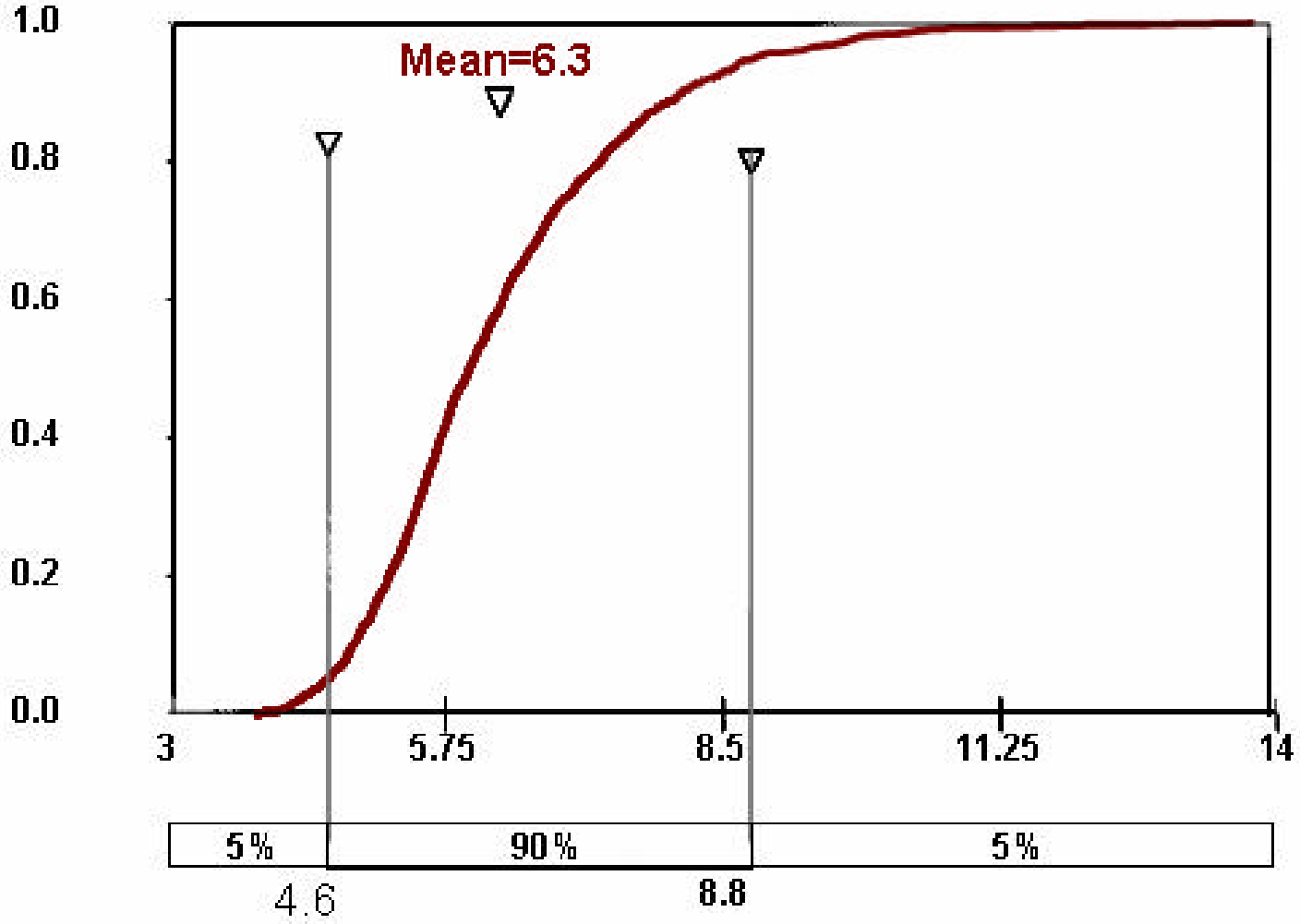
Results Summary

EGS Cases

2010/2040 MYPP Goals

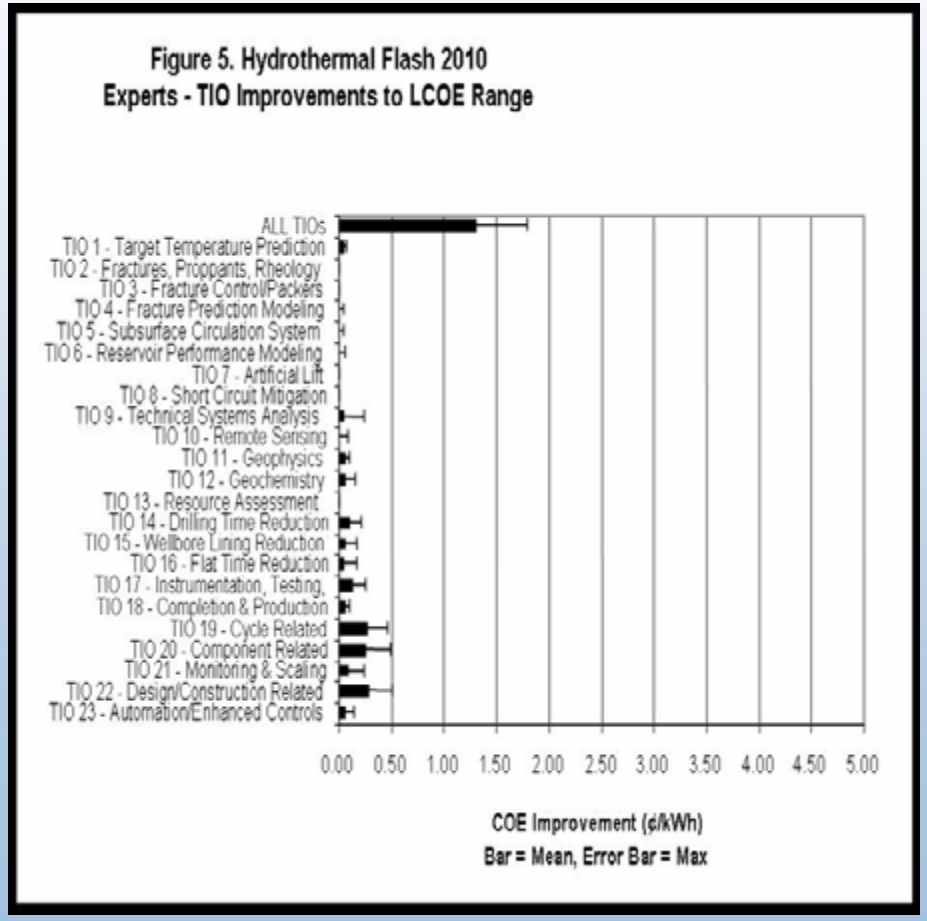


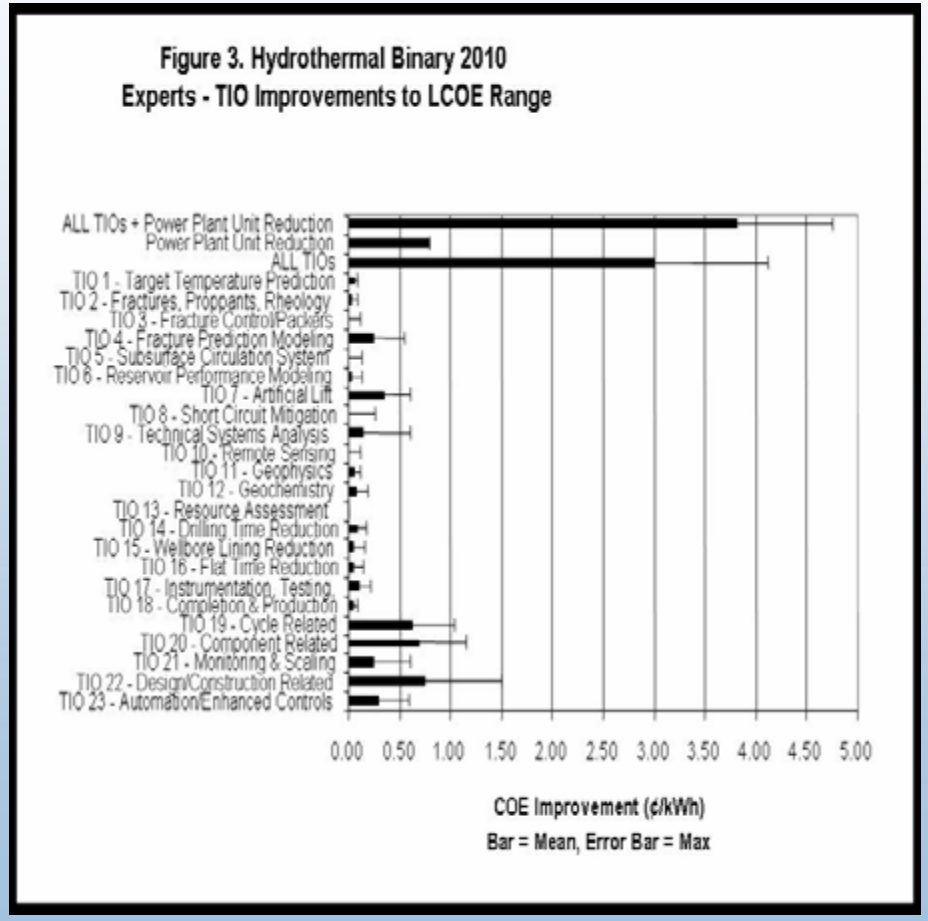
EGS Binary, Expert Case @ 2040



Probability/TIO Distributions

2010 Hydrothermal Cases





Recommendations

Optimizing program planning, performance, and value by:

- **Focus -- the 5¢/kWh LCOE by 2040 for EGS**
- **Completion -- WBS mapping to impacts -- impact and timing**
- **Investigation -- competitive task-funding scenarios**
- **Improvement -- drilling-cost models account for demand**
- **Optimization -- depths and temperature gradients**
- **Scope expansion -- geopressured, co-production resources**
- **Updating -- NEMS input data used by EIA**
- **Collaboration -- NEMS interpretation of potential**
- **Support -- NEMS evolution to risk applications**