Northwest Power and Conservation Council

Discussion of Regional Portfolio Model Results

Michael Schilmoeller

for the

Power Committee Web Conference

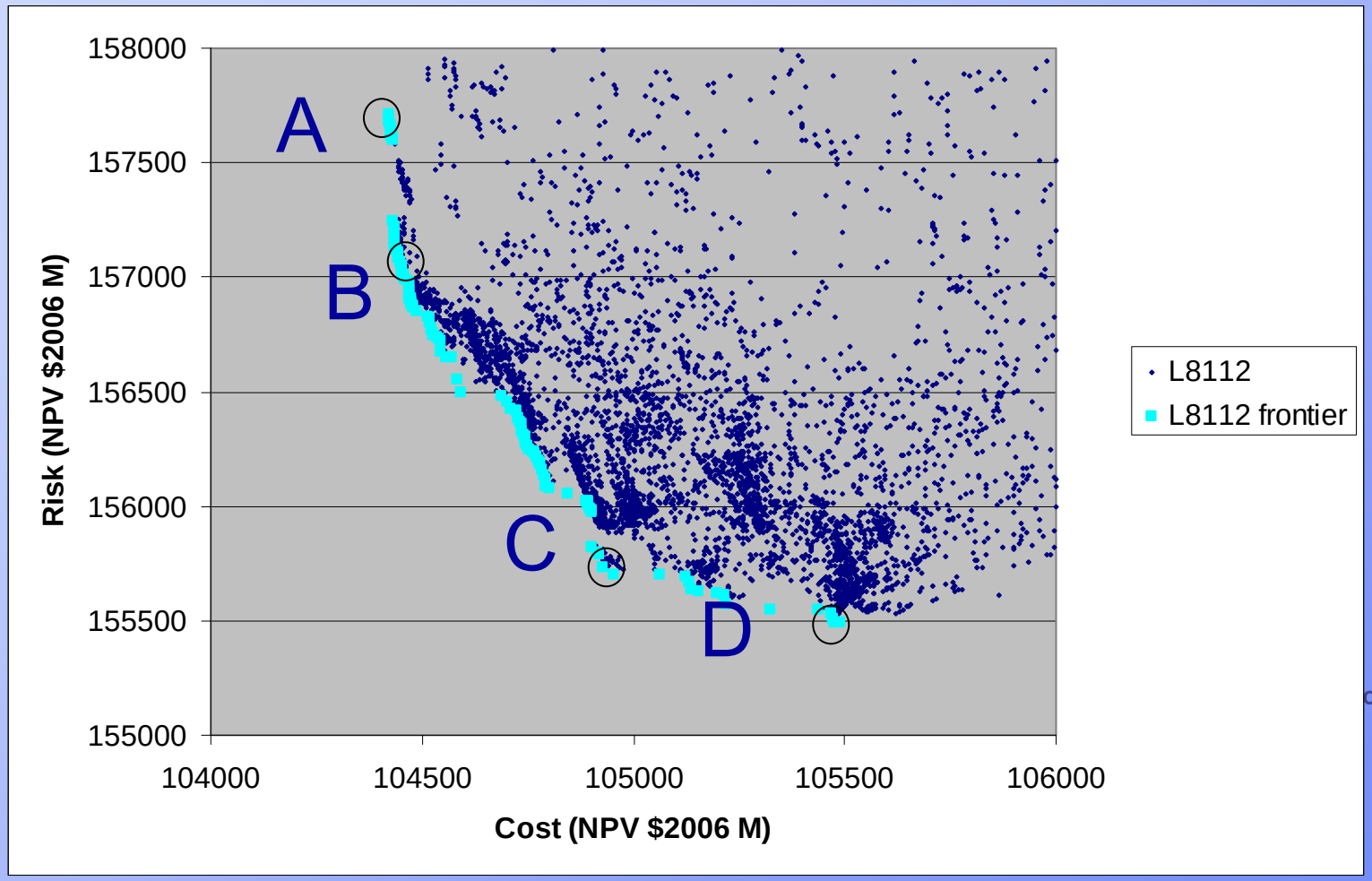
Thursday, May 28, 2009

Review

- Changes in assumptions and data
- The nature of the efficient frontier
- Plans on the efficient frontier
  - Least Risk and Least Cost Plans
    - Resource build out
    - Energy and peak adequacy
    - Carbon emissions
    - Power cost impacts
  - Plans between least-cost and least-risk
    - Resource build out
- Discretionary conservation ramp rate effects Interpreting a plan

Northwest Power and Conservation Council

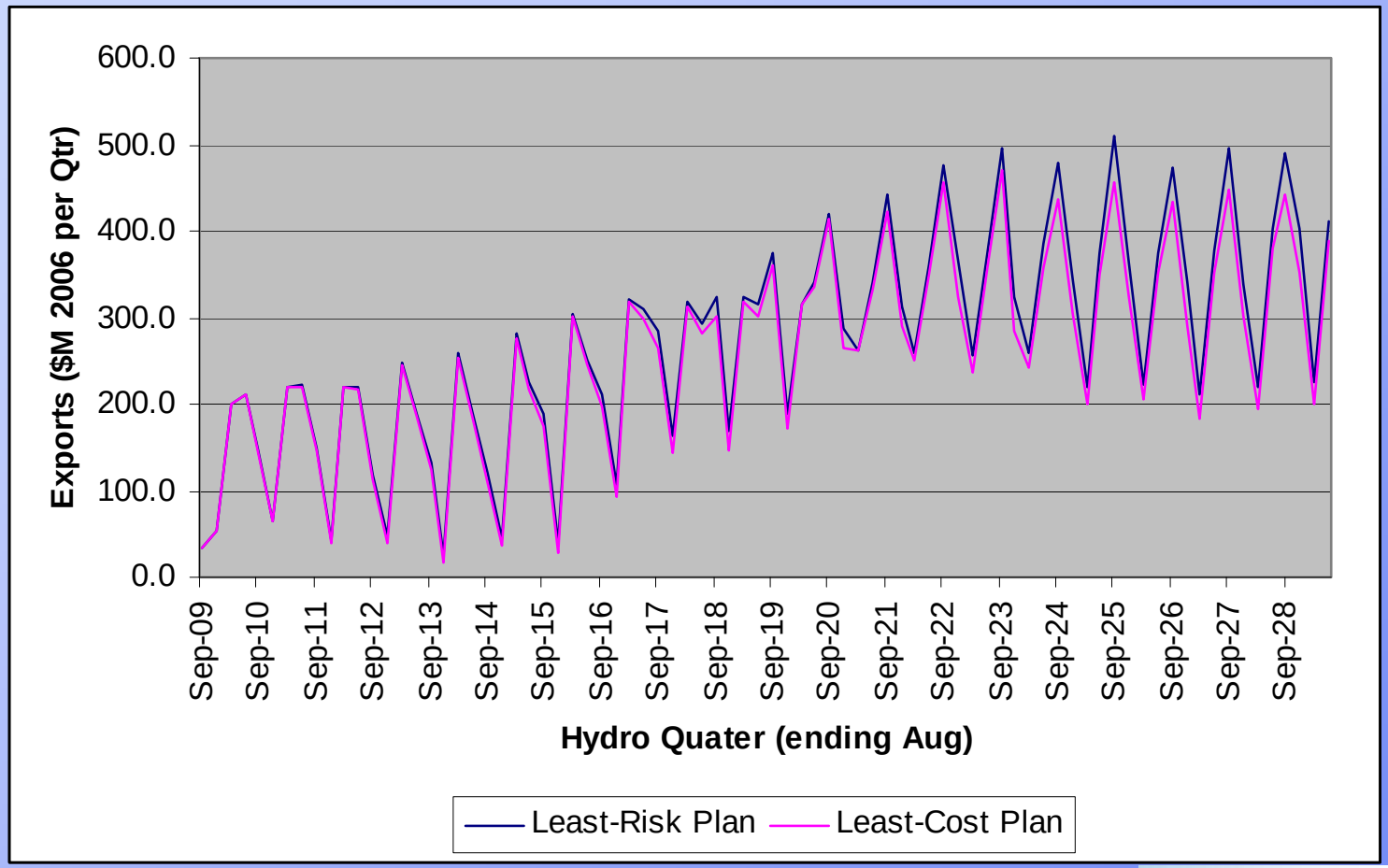
Efficient Frontier



Source: Analysis of Optimization Run_L811 090510 2101.xls

Northwest Power and Conservation Council

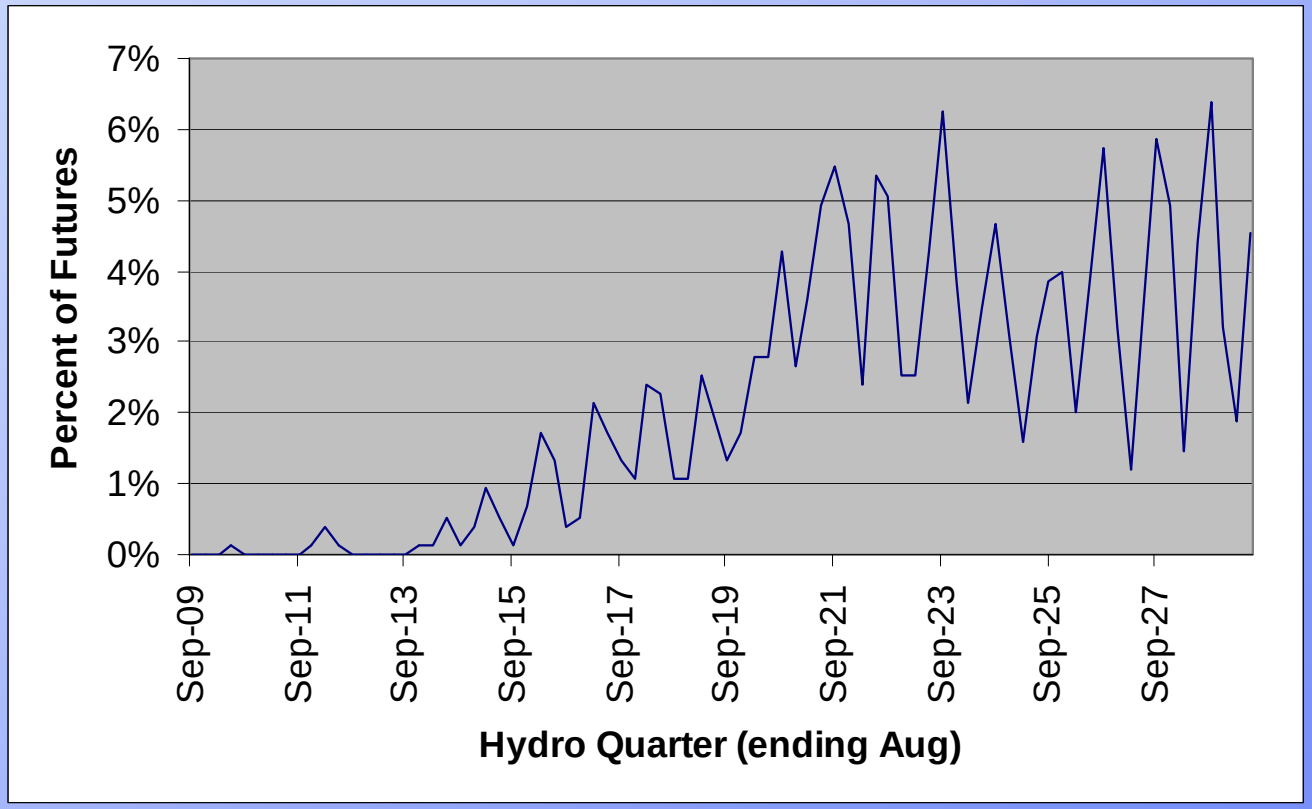
Comparison of Average Exports for the Least-Risk and Least-Cost Plans



Source: Comp.xls, worksheet "DATA (2) LR"

Northwest Power and Conservation Council

Likelihood the Least-Risk Plan Would Reduce Market Exposure By At Least $300 M In A Hydro Quarter



Source: Comp.xls, worksheet "LR-LC qtr future"

Northwest Power and Conservation Council

The Choice

- A plan with more resources reduces dependence on the power market and increases power price and rate stability
- A plan with resources provides guidance to the region regarding the resources that promote an efficient and reliable system
- Very little difference exists between least-cost and least-risk plans in the five-year Action Plan time period.
- The least-risk plan preserves decision milestones

Northwest Power and Conservation Council

Northwest Power and Conservation Council

End

Plan A

Plan A Discretionary demand response: none

10 Lost opportunity conservation cost-effectiveness threshold, premium over market ($2006/MWh)

2941 Lost opportunity conservation by end of study (MWa)*

10 Discretionary conservation cost-effectiveness threshold, premium over market ($2006/MWh)

2585 Discretionary conservation by end of study (MWa) assuming 160MWa/year limit

5527 Total conservation (MWa)

Cumulative MW, by earliest date to begin construction

	Dec-10	Dec-13	Dec-15	Dec-17	Dec-19	Dec-23	Dec-25
CCCT	0	0	0	0	0	0	0
SCCT	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
and the *larger* of							
Wind	0	0	0	0	0	0	0
RPS* req	0	**321**	**1193**	**2007**	**3061**	**4930**	**5363**

Source: Schedules for plan resources 090519.xls

Northwest Power and Conservation Council

Plan B

Plan B Discretionary demand response: none

20 Lost opportunity conservation cost-effectiveness threshold, premium over market ($2006/MWh)

3042 Lost opportunity conservation by end of study (MWa)*

10 Discretionary conservation cost-effectiveness threshold, premium over market ($2006/MWh)

2581 Discretionary conservation by end of study (MWa) assuming 160MWa/year limit

5623 Total conservation (MWa)

Cumulative MW, by earliest date to begin construction

	Dec-10	Dec-13	Dec-15	Dec-17	Dec-19	Dec-23	Dec-25
CCCT	0	0	0	0	0	**415**	**415**
SCCT	0	0	0	0	0	0	**170**
Geothermal	0	0	0	0	0	**13**	**39**
and the *larger* of							
Wind	0	**300**	**300**	**600**	**600**	**600**	**600**
RPS* req	0	**320**	**1189**	**1994**	**2982**	**4607**	**4985**

Source: Schedules for plan resources 090519.xls

Northwest Power and Conservation Council

Plan C

Plan C Discretionary demand response: none

40 Lost opportunity conservation cost-effectiveness threshold, premium over market ($2006/MWh)

3198 Lost opportunity conservation by end of study (MWa)*

10 Discretionary conservation cost-effectiveness threshold, premium over market ($2006/MWh)

2575 Discretionary conservation by end of study (MWa) assuming 160MWa/year limit

5773 Total conservation (MWa)

Cumulative MW, by earliest date to begin construction

	Dec-10	Dec-13	Dec-15	Dec-17	Dec-19	Dec-23	Dec-25
CCCT	0	0	0	0	0	**415**	**415**
SCCT	0	0	**170**	**170**	**170**	**170**	**170**
Geothermal	0	0	0	**52**	**104**	**156**	**156**
and the *larger* of							
Wind	0	0	**300**	**300**	**2100**	**2100**	**2100**
RPS* req	0	**319**	**1186**	**1981**	**2904**	**4283**	**4607**

Source: Schedules for plan resources 090519.xls

Northwest Power and Conservation Council

Plan D

Plan D Discretionary demand response: none

50 Lost opportunity conservation cost-effectiveness threshold, premium over market ($2006/MWh)

3253 Lost opportunity conservation by end of study (MWa)*

10 Discretionary conservation cost-effectiveness threshold, premium over market ($2006/MWh)

2573 Discretionary conservation by end of study (MWa) assuming 160MWa/year limit

5827 Total conservation (MWa)

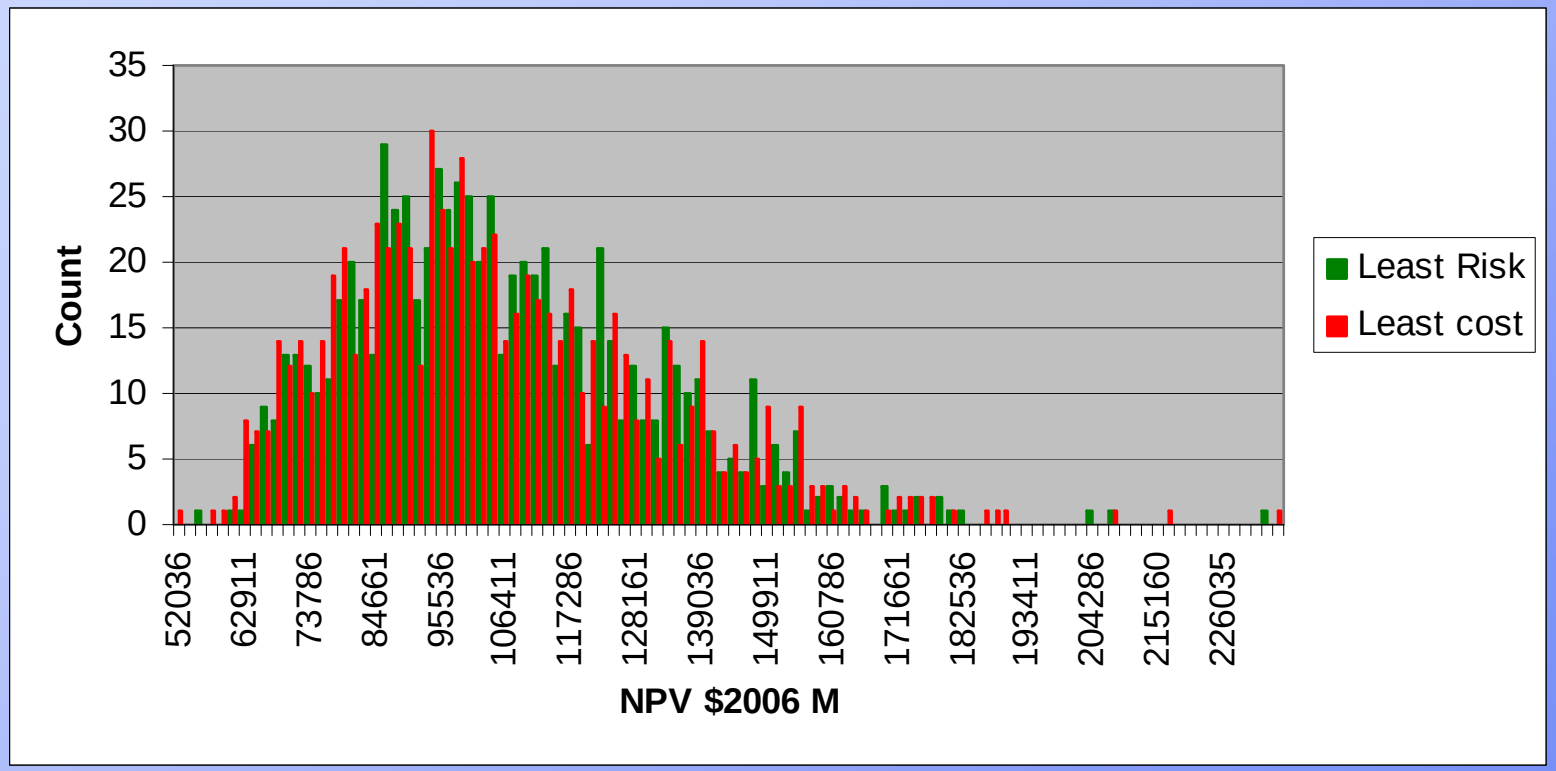
Cumulative MW, by earliest date to begin construction

	Dec-10	Dec-13	Dec-15	Dec-17	Dec-19	Dec-23	Dec-25
CCCT	0	0	0	**415**	**830**	**830**	**830**
SCCT	0	0	**170**	**170**	**170**	**170**	**170**
Geothermal	0	0	0	**52**	**104**	**156**	**169**
and the *larger* of							
Wind	0	0	**1200**	**1200**	**3000**	**3000**	**3000**
RPS* req	0	**317**	**1182**	**1968**	**2825**	**3959**	**4229**

Source: Schedules for plan resources 090519.xls

Northwest Power and Conservation Council

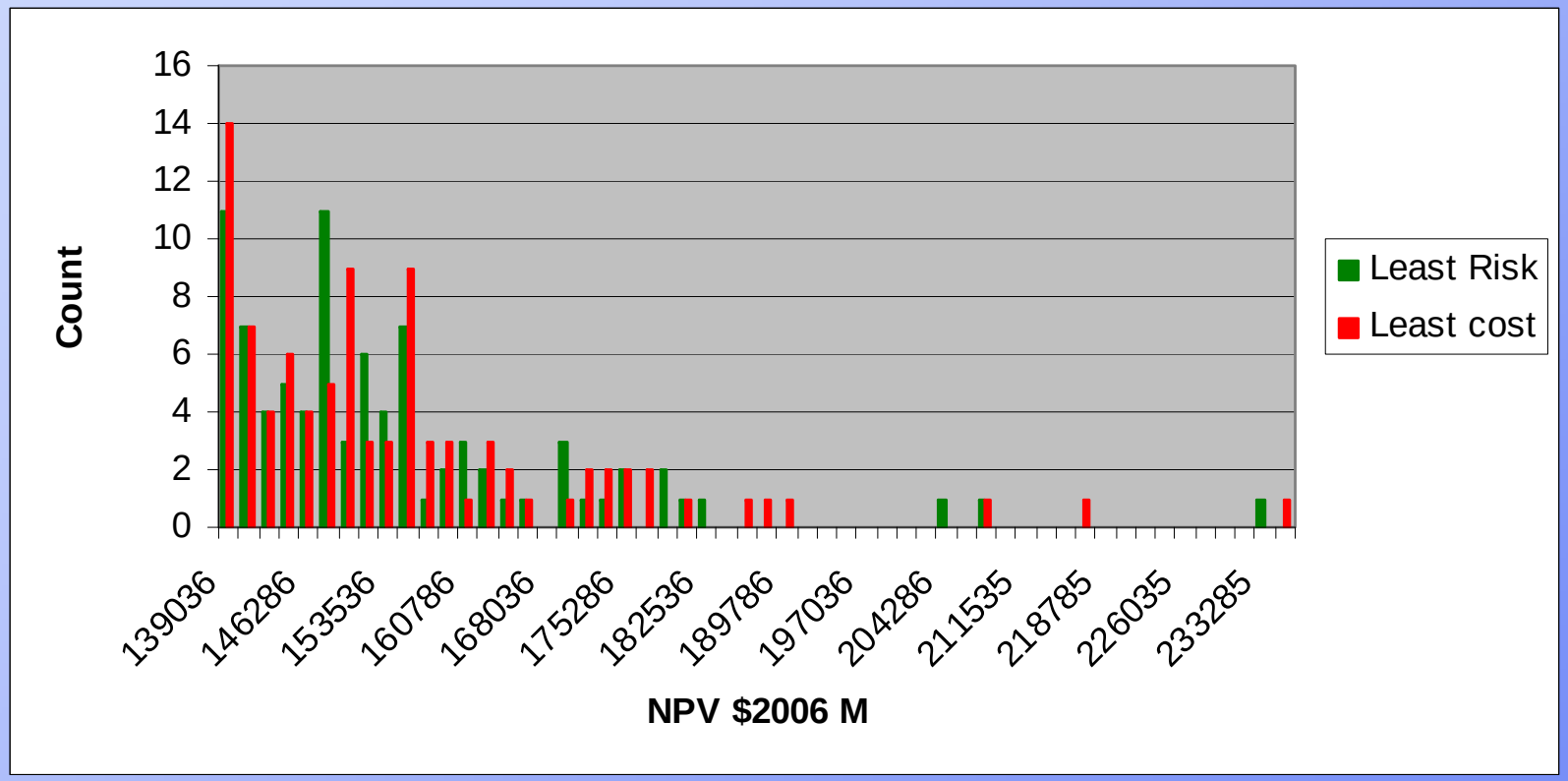
Difference in Cost Distributions
1 of 3



Source: LR&LC_distributions.xls, worksheet "LR and LC"

Northwest Power and Conservation Council

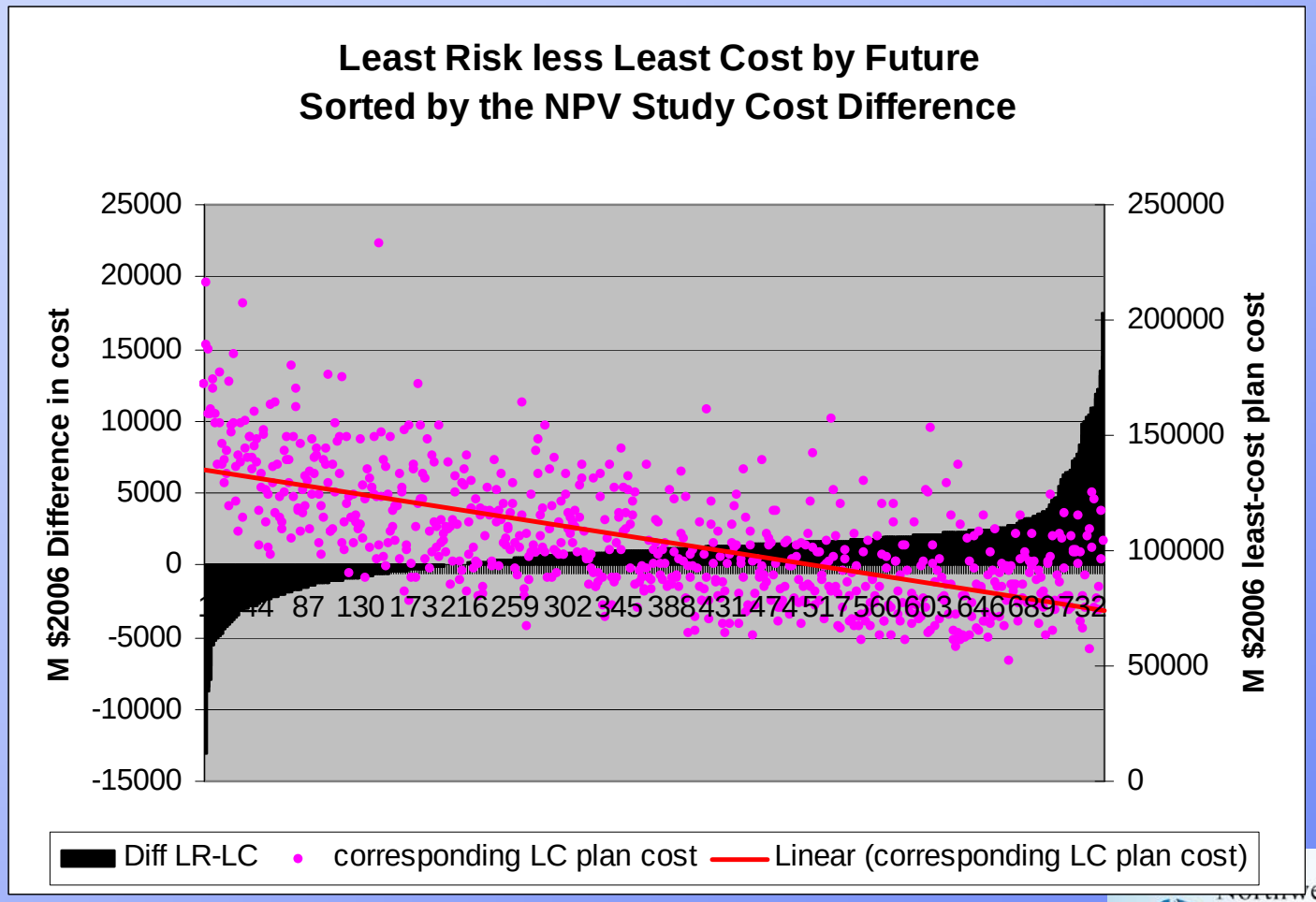
Difference in Cost Distributions
2 of 3



Source: LR&LC_distributions.xls, worksheet "LR and LC"

Northwest Power and Conservation Council

Difference in Cost Distributions 3 of 3



Source: LR&LC_distributions.xls, worksheet "LR less LC"

Northwest Power and Conservation Council