



**CALIFORNIA ISO**

California Independent  
System Operator

# **STEP**

# **Economic Study Updates**

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*California ISO Grid Planning*

*November 2, 2003*



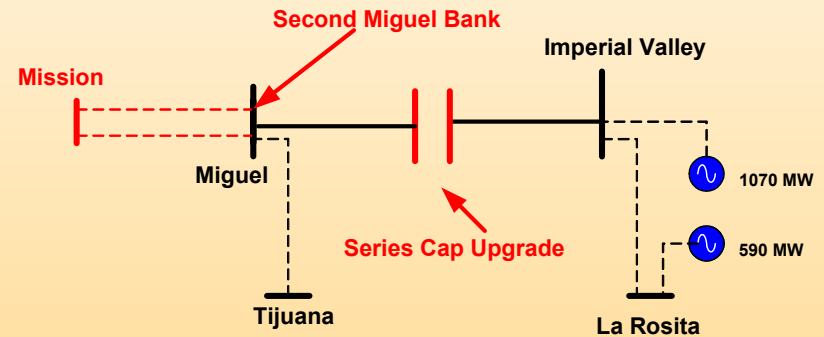
## Overview

- Basecase results
  - Miguel Improvements, Common Upgrades and AZ/CA Line.
- Sensitivity results
  - Otay Mesa, Palomar and Mountainview
  - Mohave units in service
  - Low hydro conditions
  - High gas prices



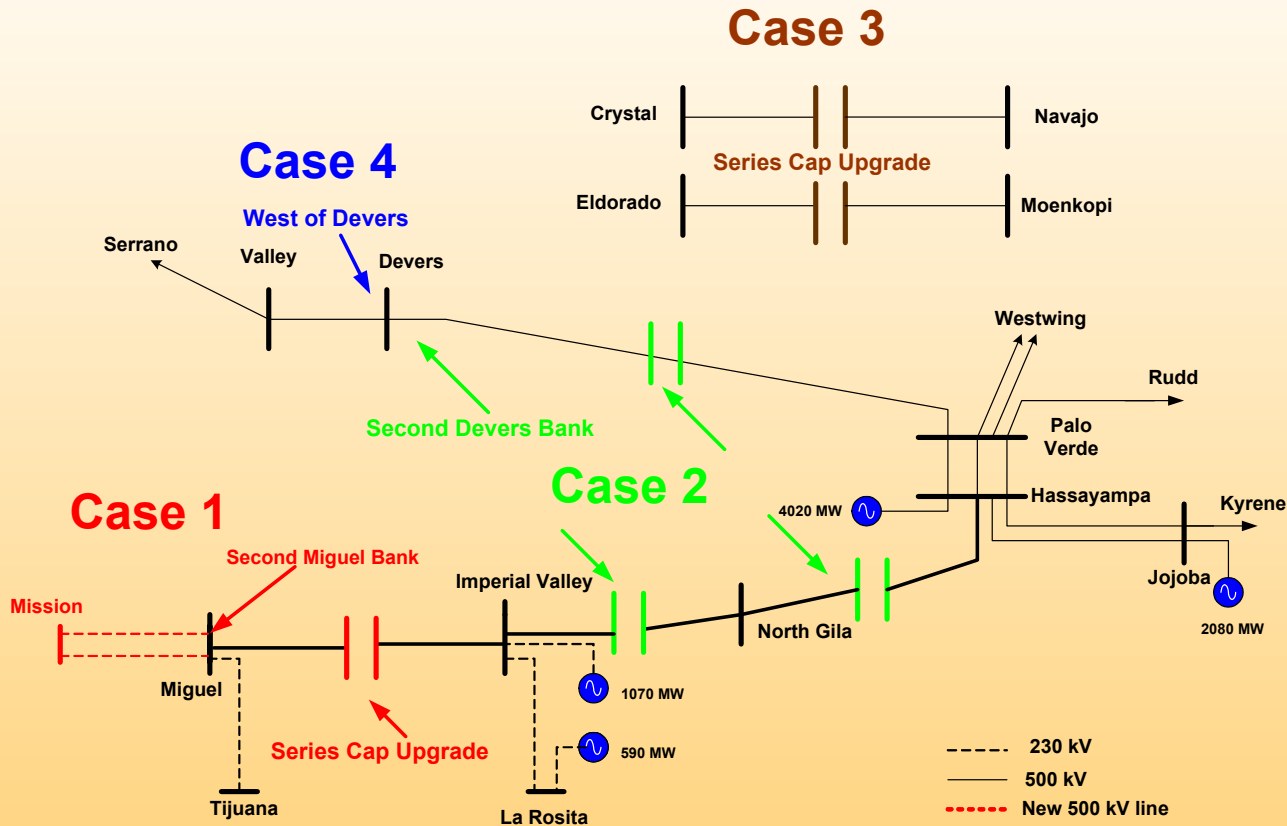
## Miguel Upgrade

- Second Miguel bank, second Miguel – Mission 230 kV Line and Imperial Valley – Miguel series cap upgrade are considered to be in the starting case (Case 1).





## Sequence of Short-term (Common) Upgrades





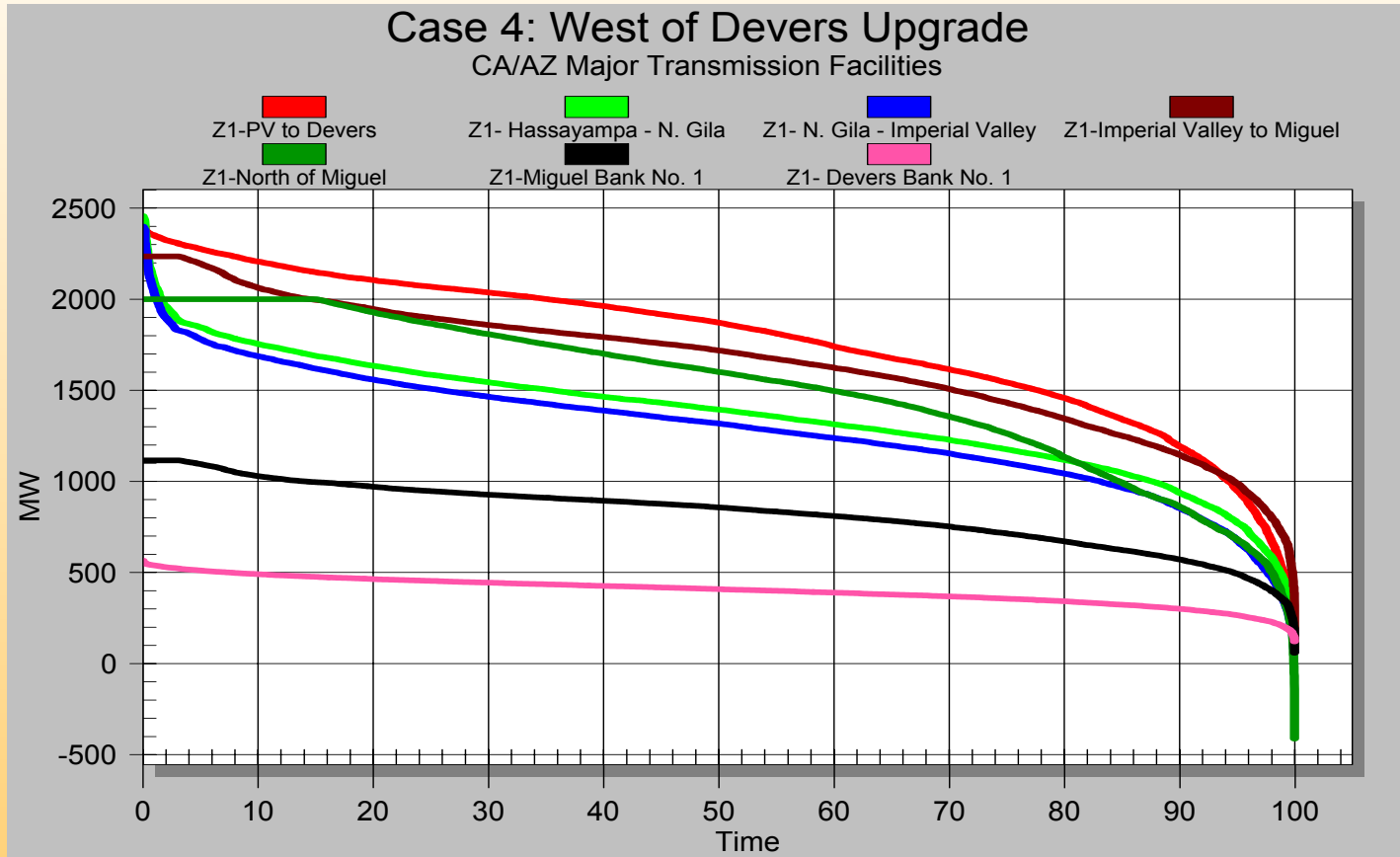
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# Basecase Results

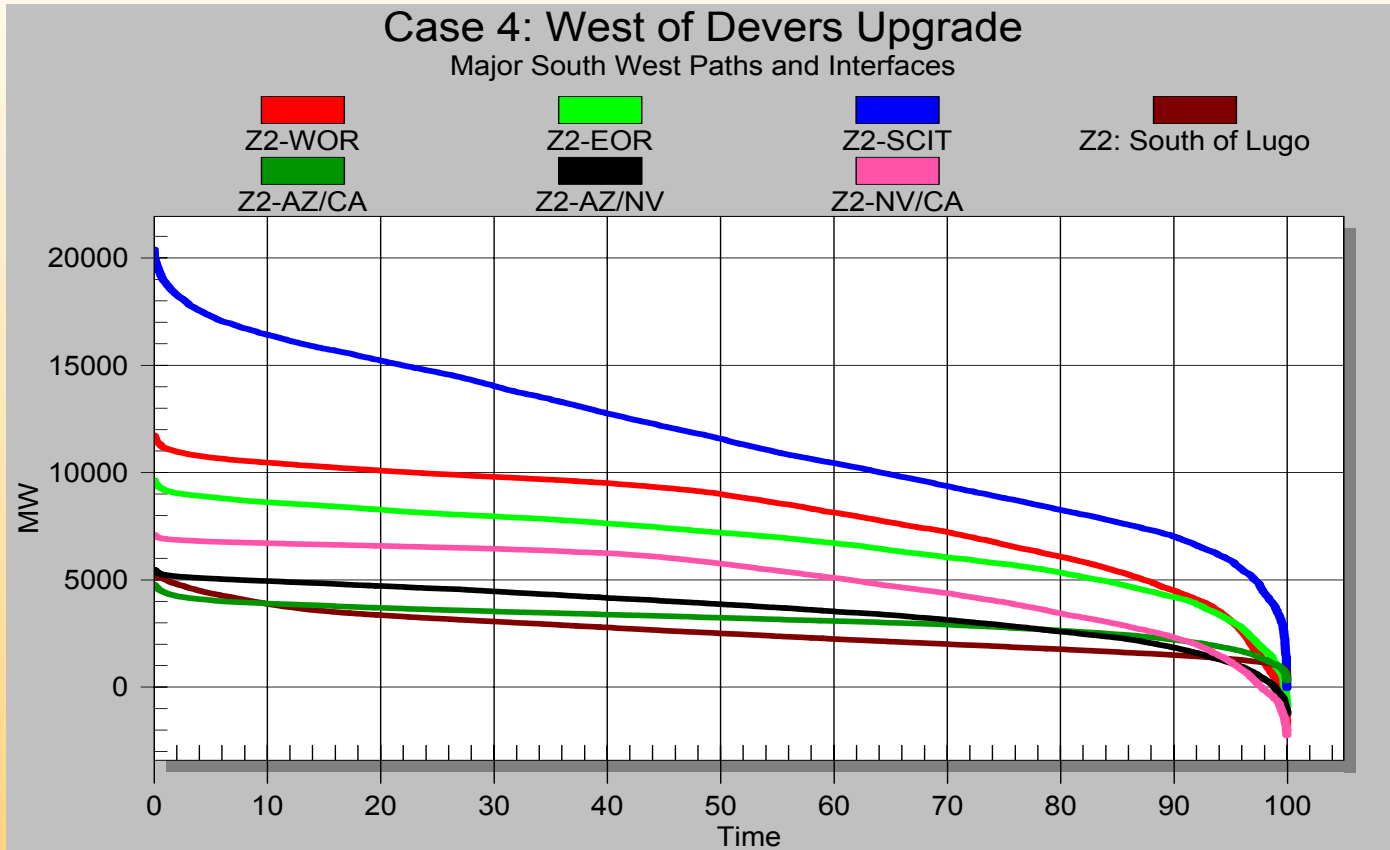


## Short-term Upgrades



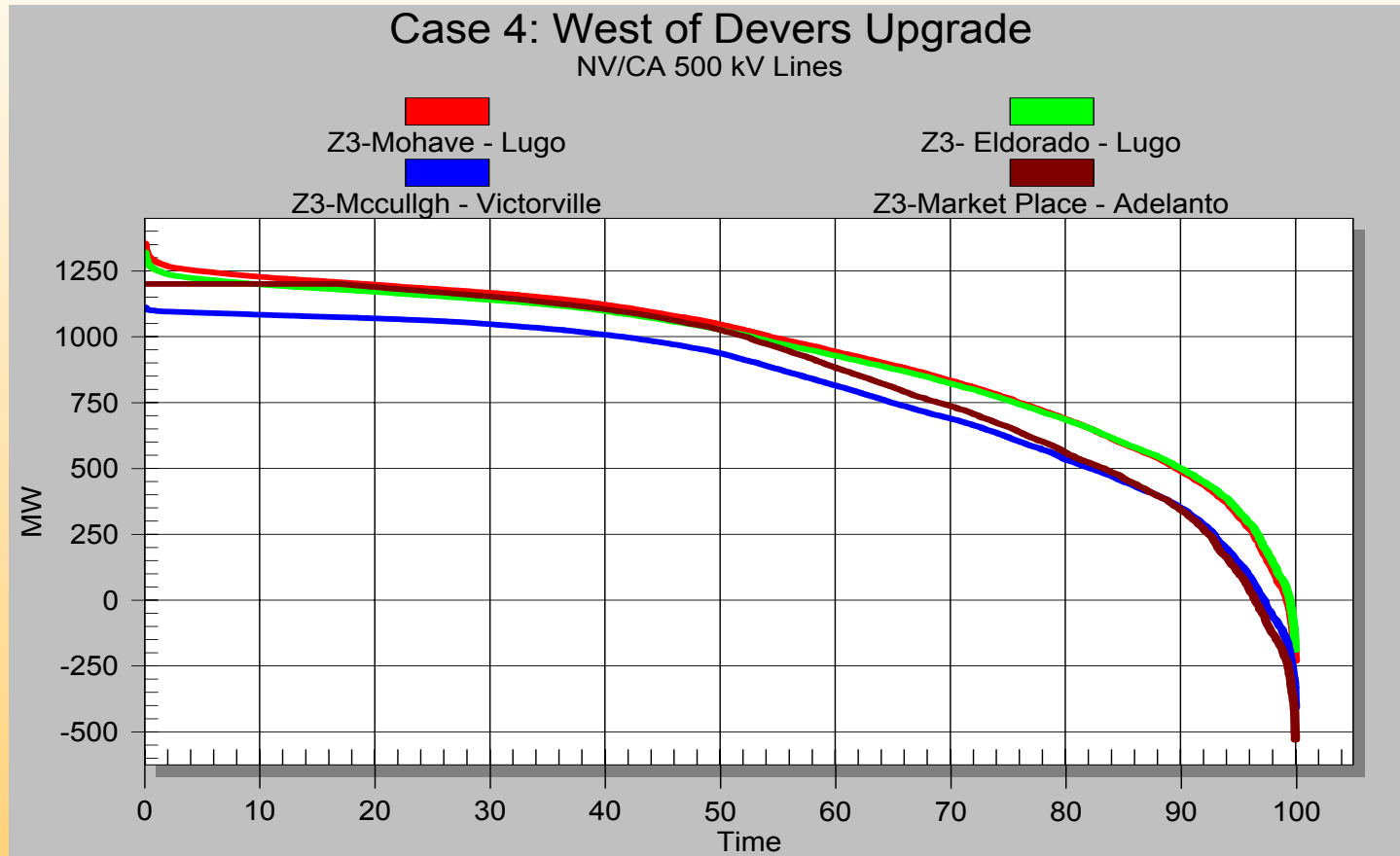


## Short-term Upgrades



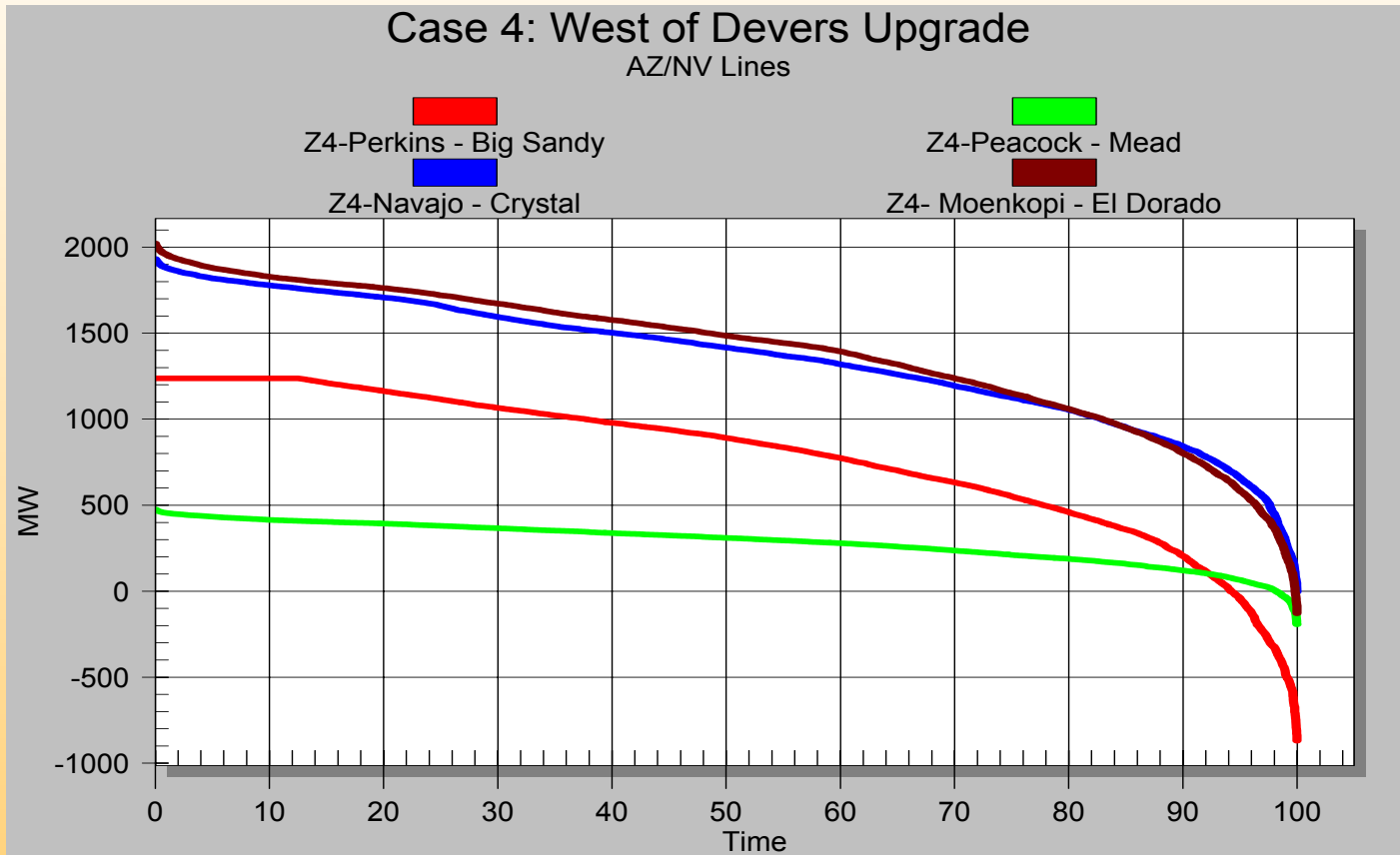


## Short-term Upgrades





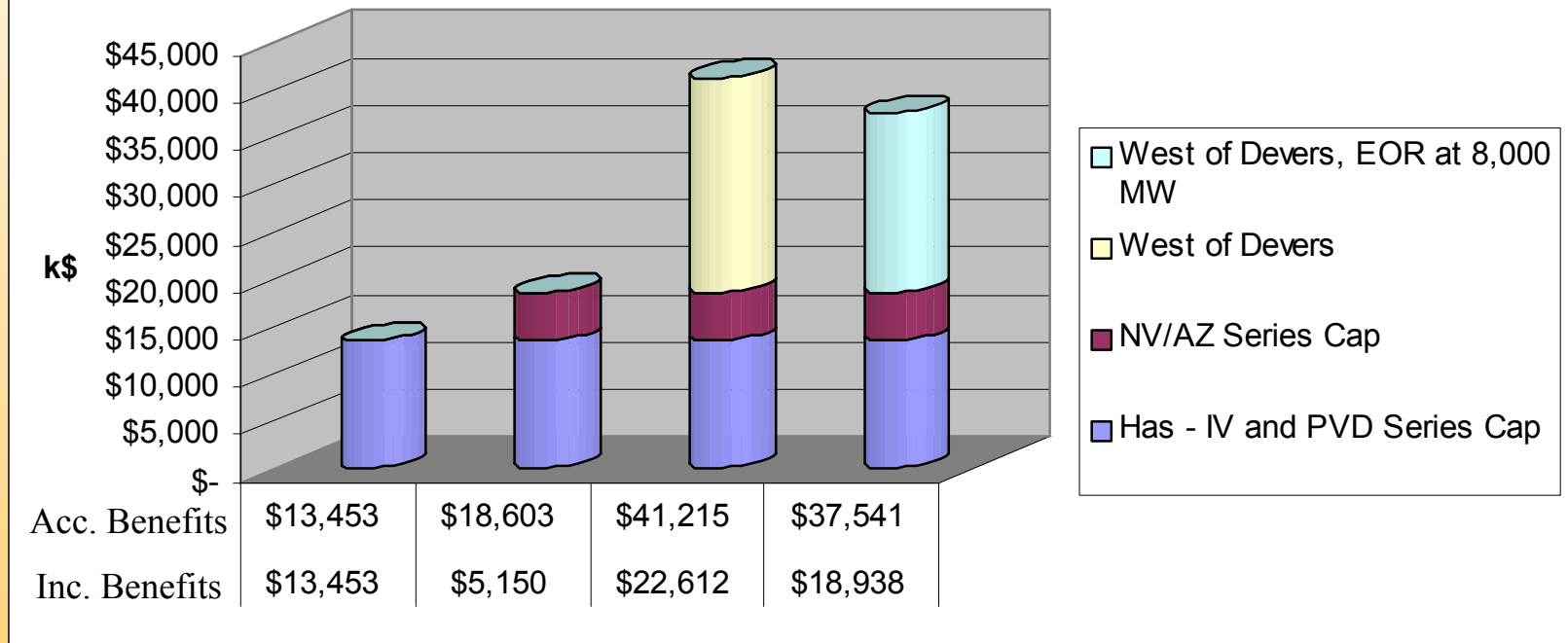
## Short-term Upgrades





## Short-term Upgrades

### WECC Production Cost Saving Due to Short-term Upgrades



## Levelized Short-term Capital Cost Estimate \$42.3 M/Year

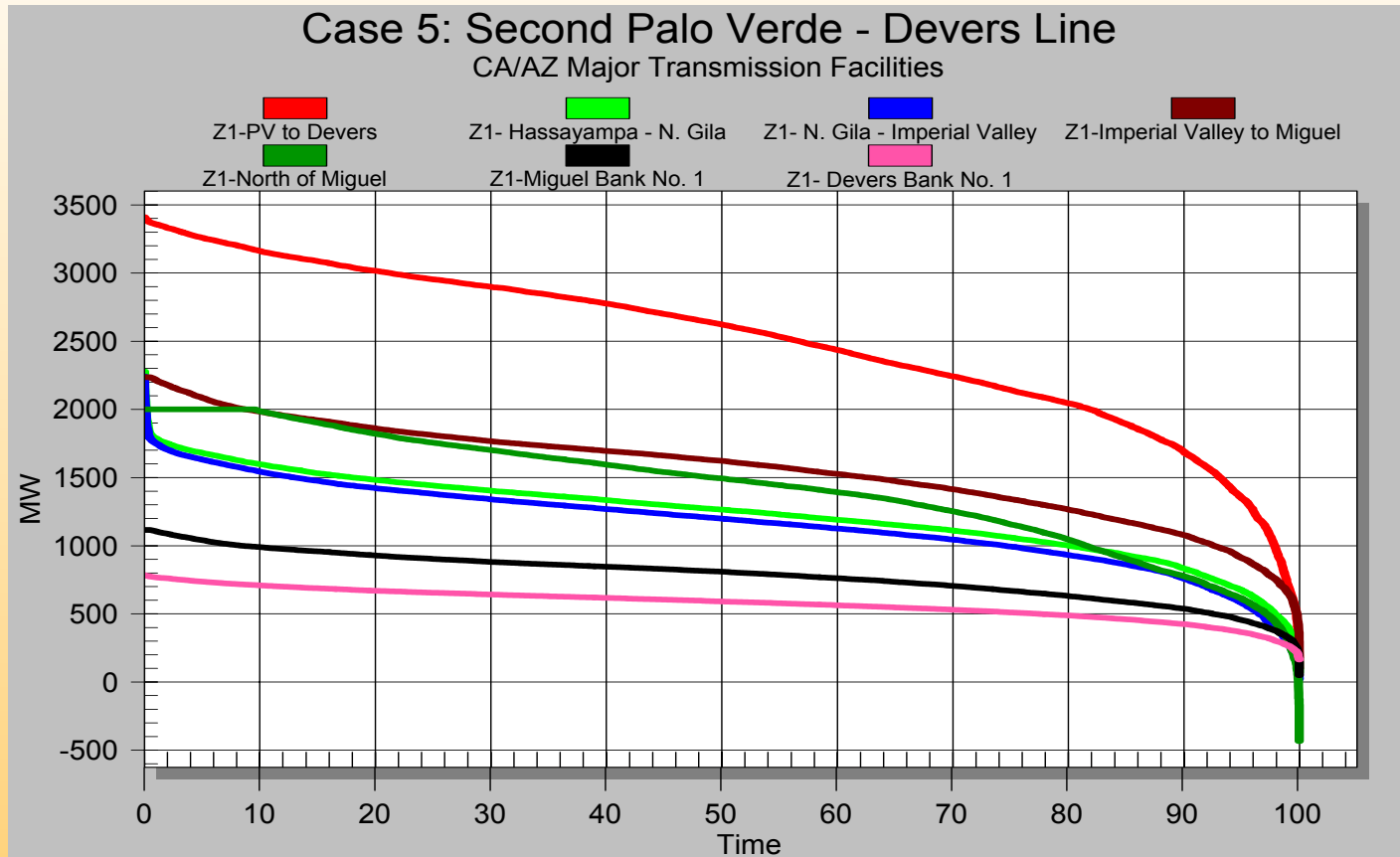


## Mid-term Upgrades (AZ/CA Line)

- Case5: Palo Verde – Devers 2
- Case5b: Trilby Wash – Parker – Blythe – Devers and Trilby Wash – Westwing
- Case5c: Convert Perkins – Mead – Adelanto to DC and extend it to Mira Loma

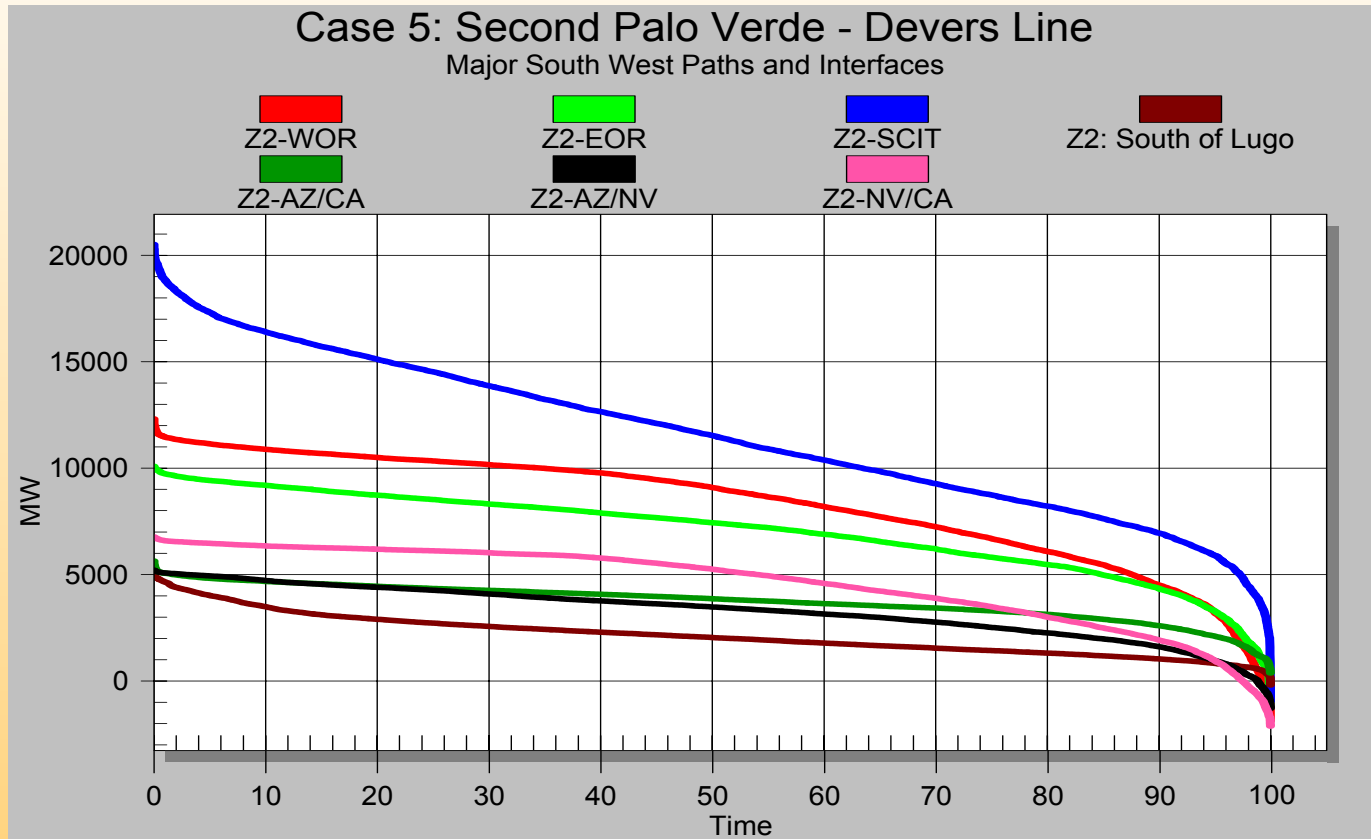


## Mid-term Upgrades



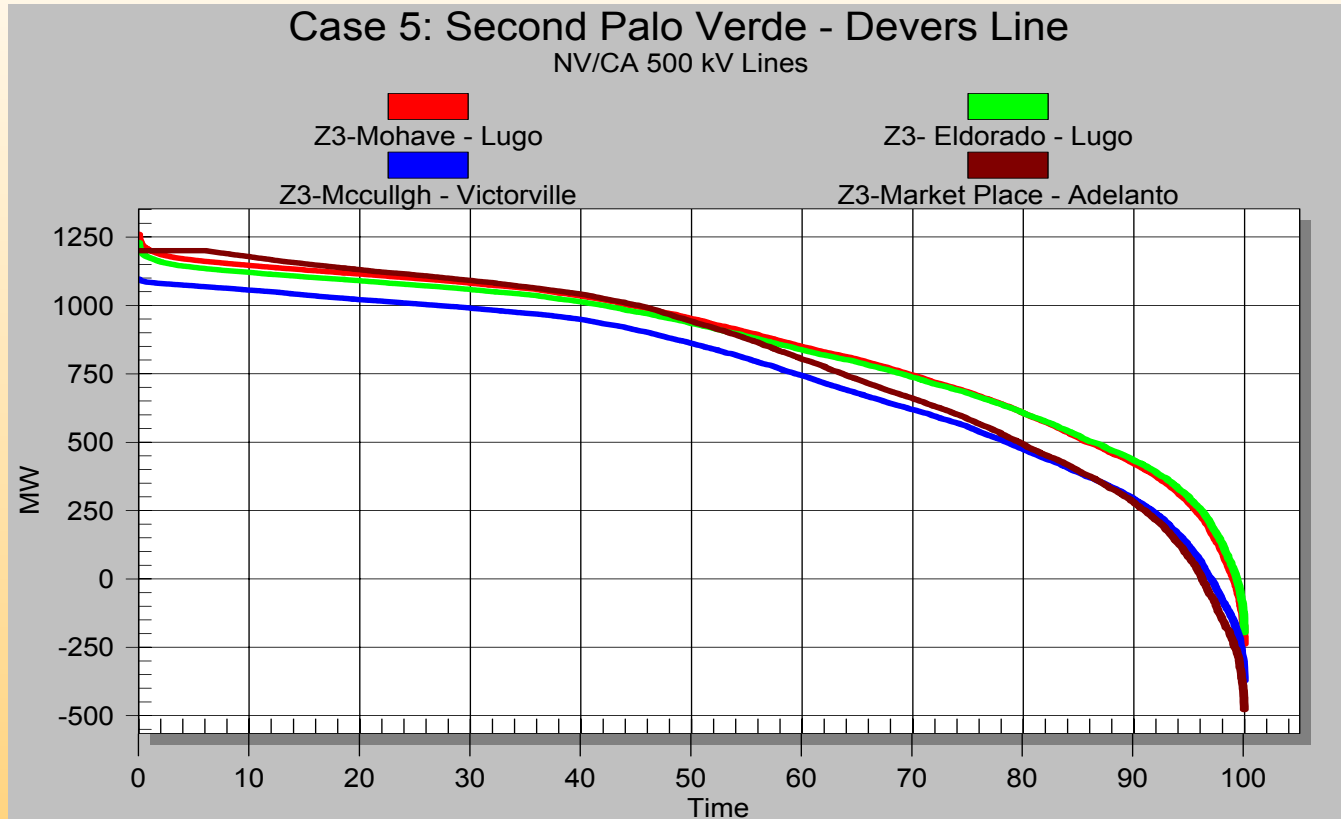


## Mid-term Upgrades



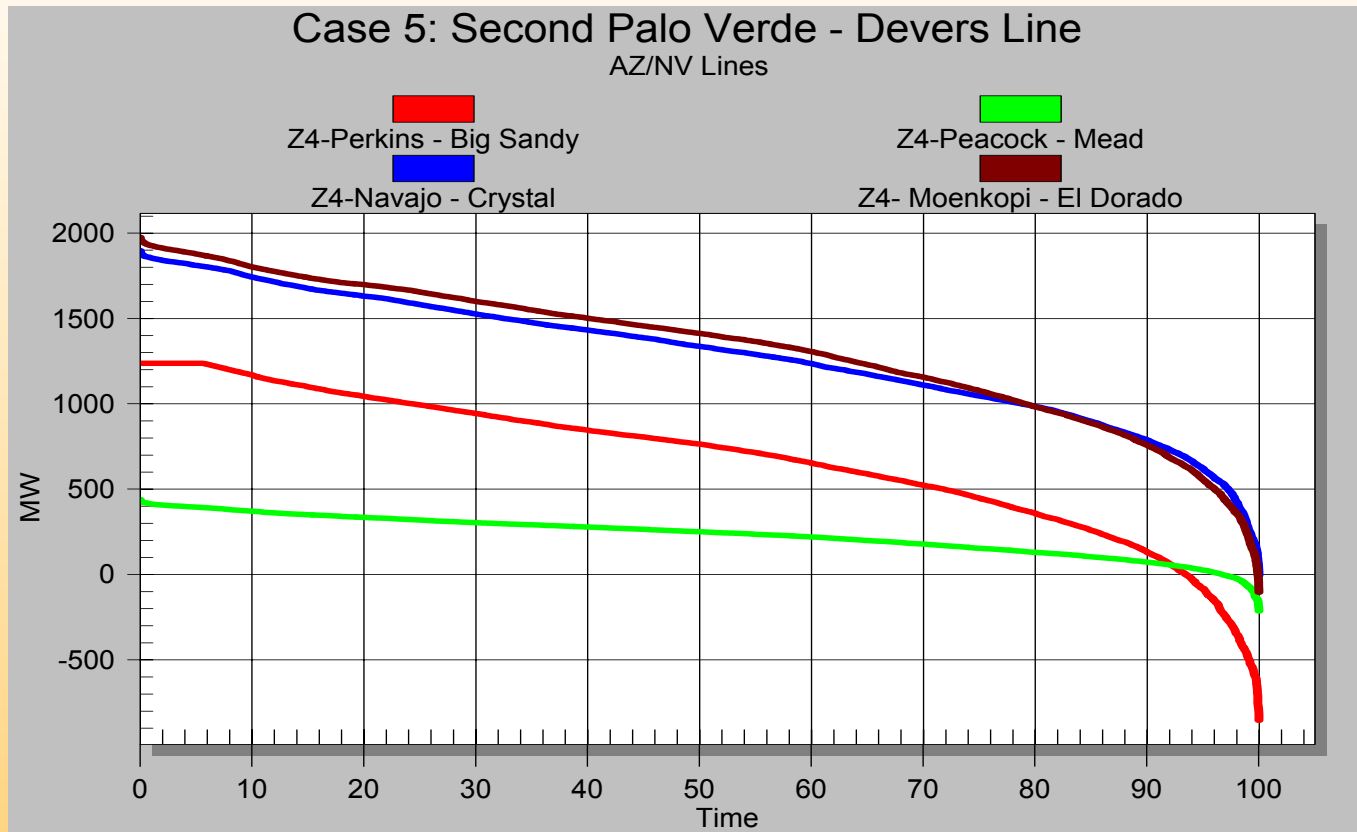


## Mid-term Upgrades



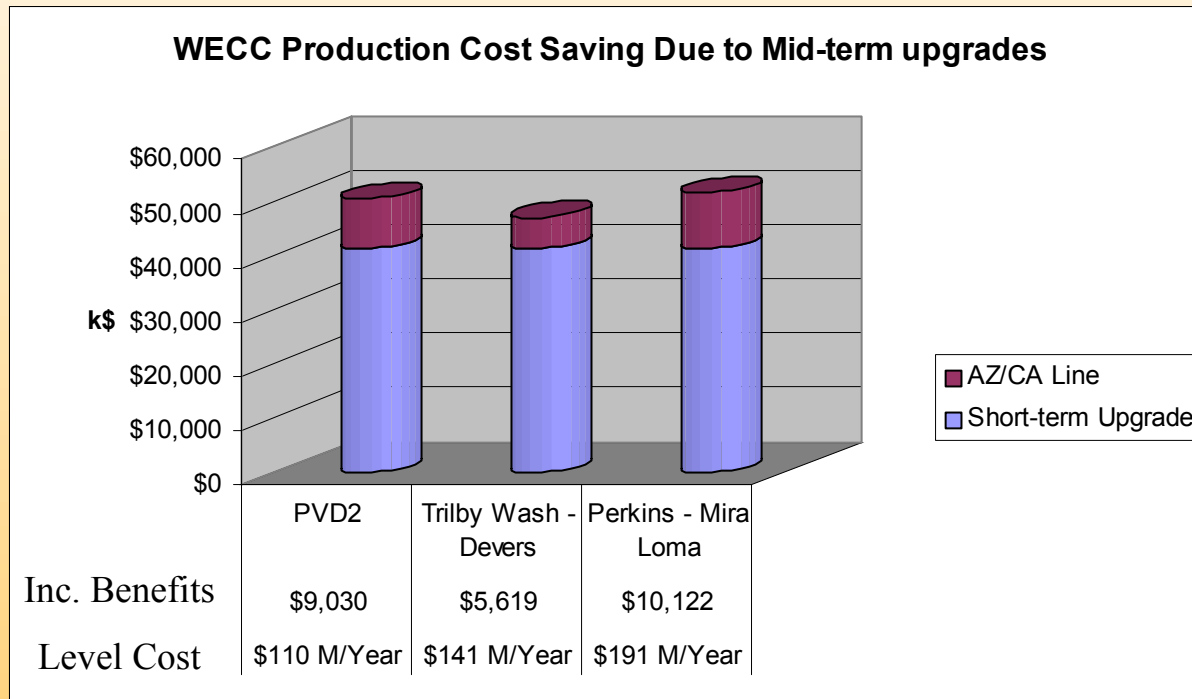


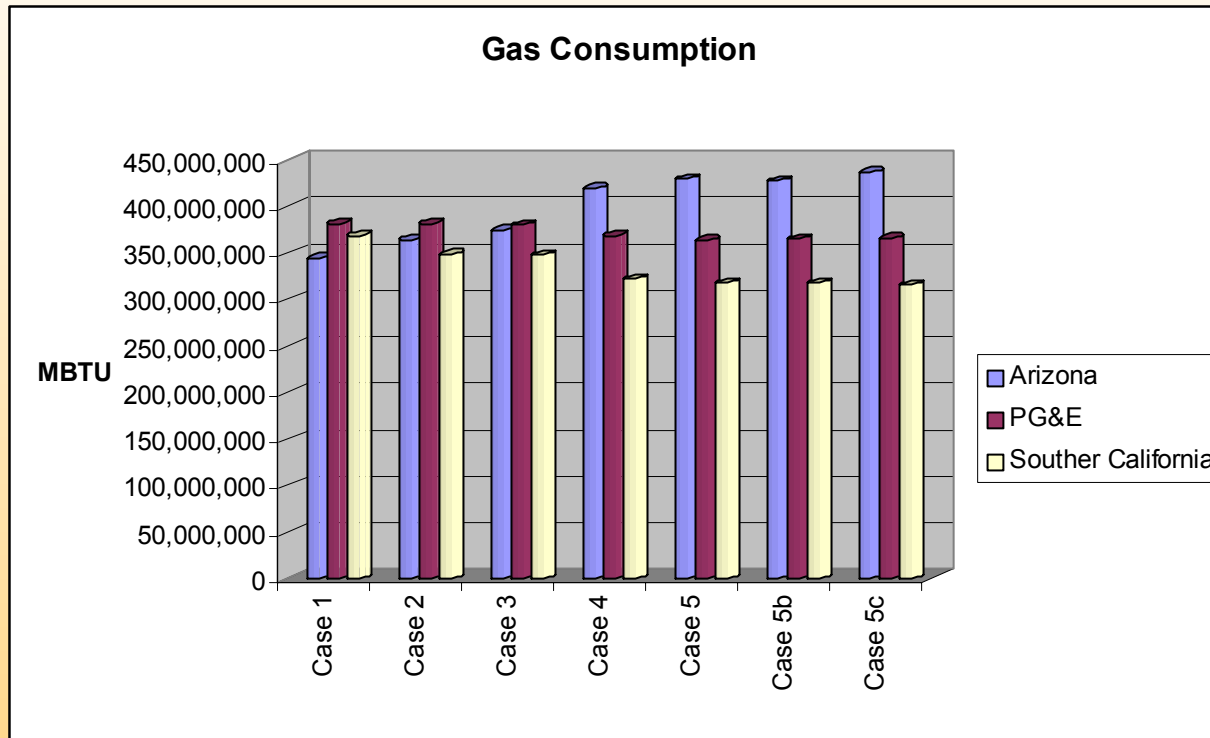
## Mid-term Upgrades





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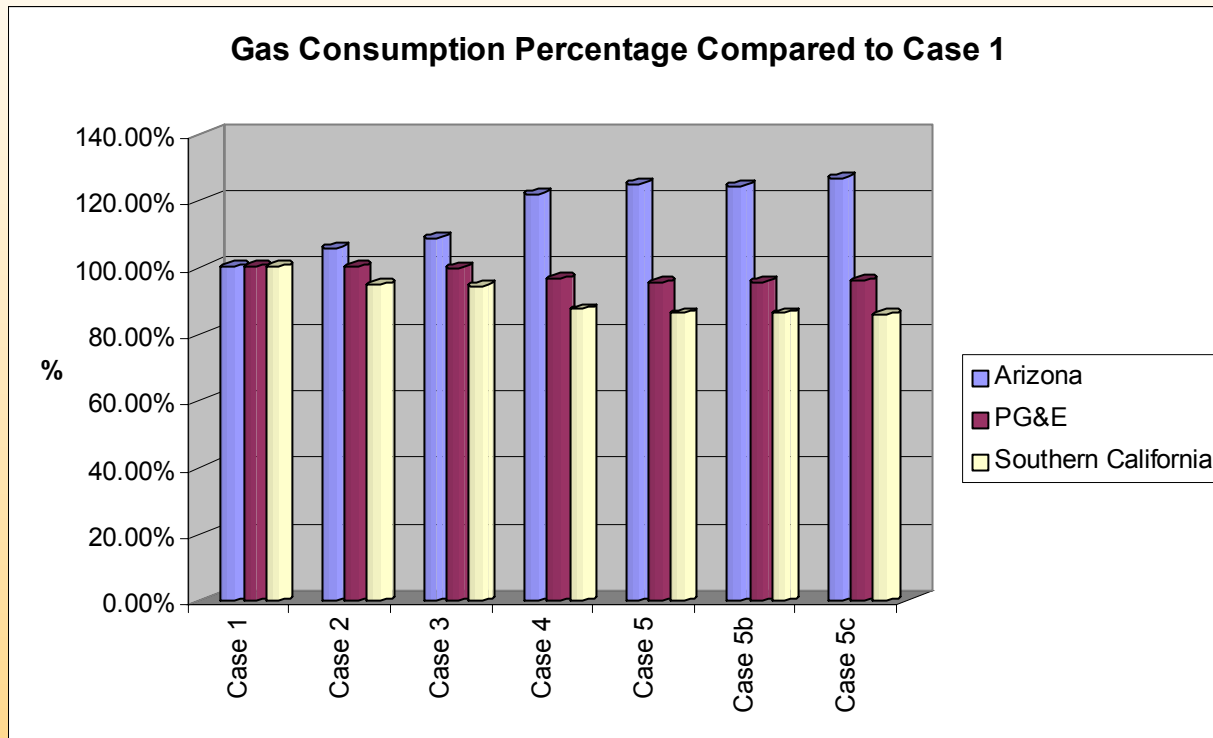






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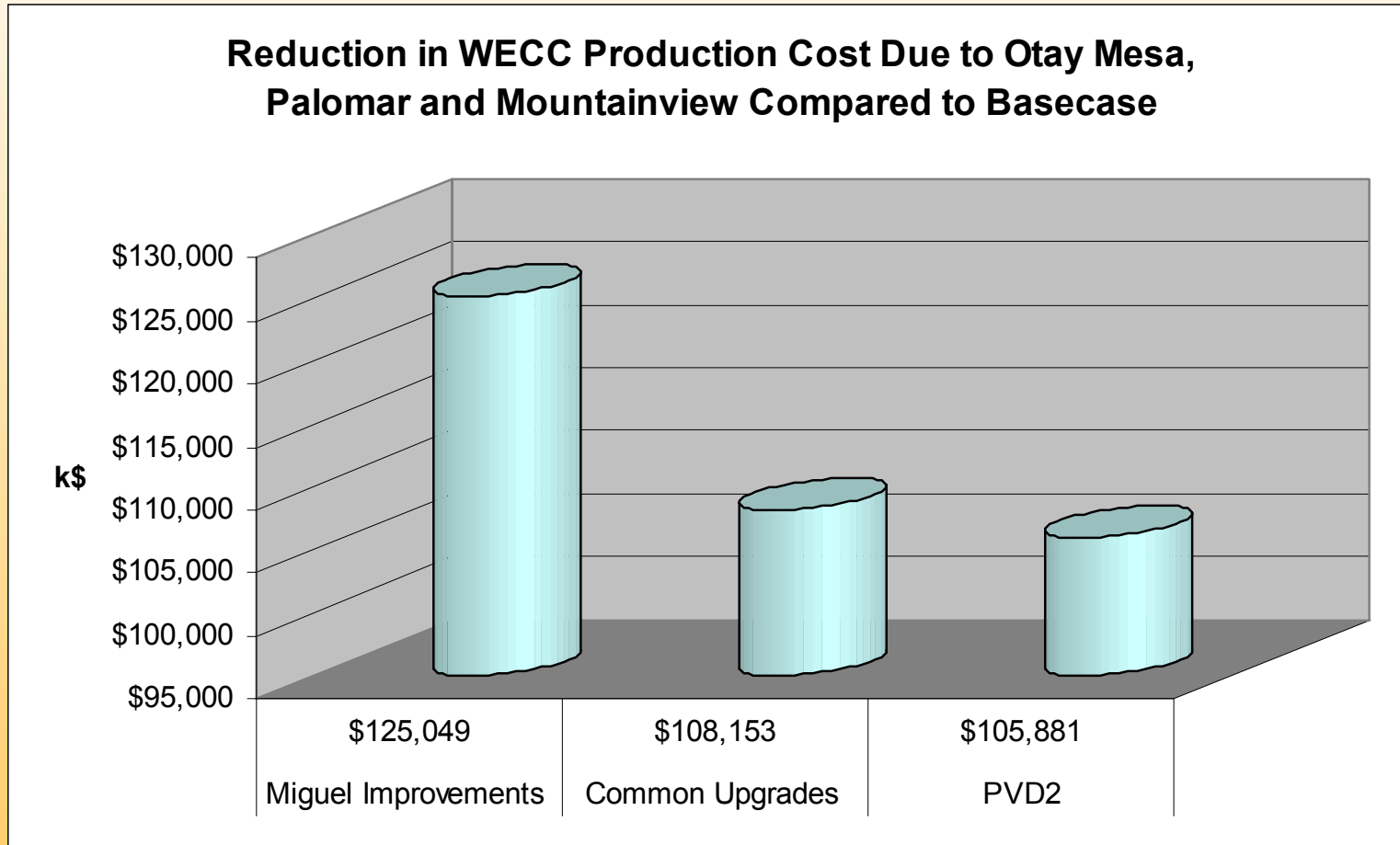
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# Sensitivity Results

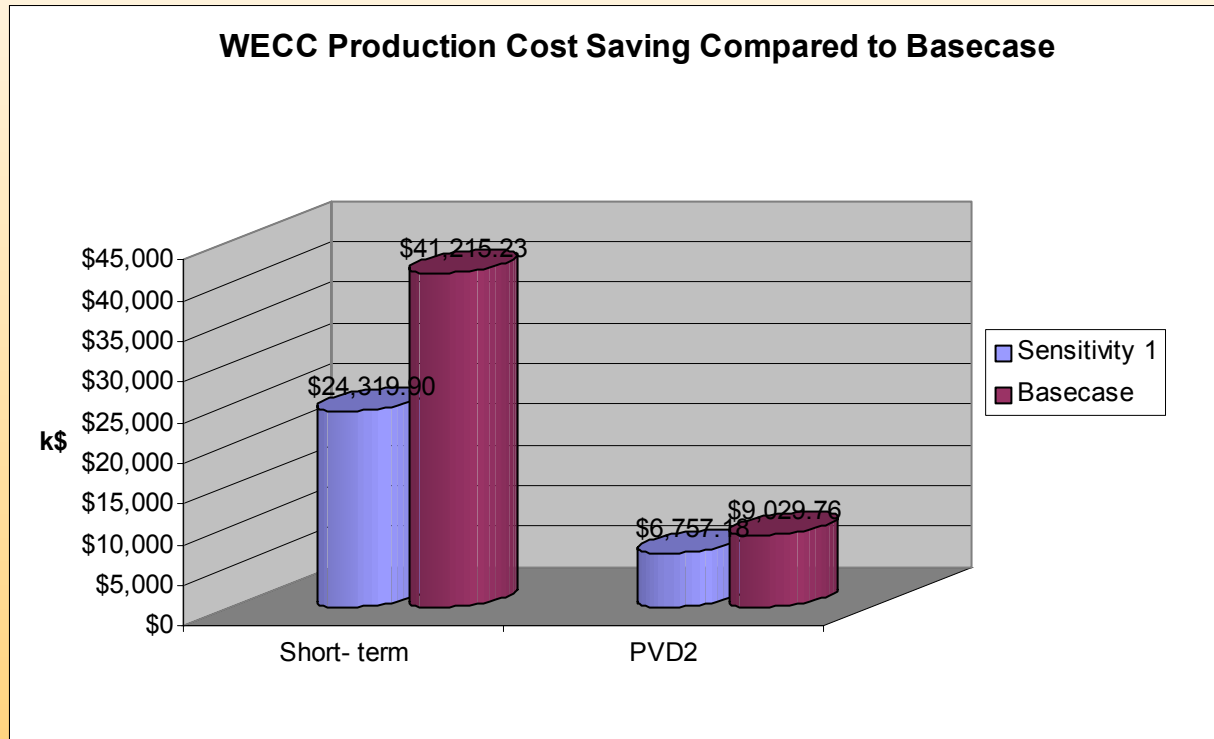


## Sensitivity 1: Otoy Mesa, Palomar and Mountainview Generation Projects





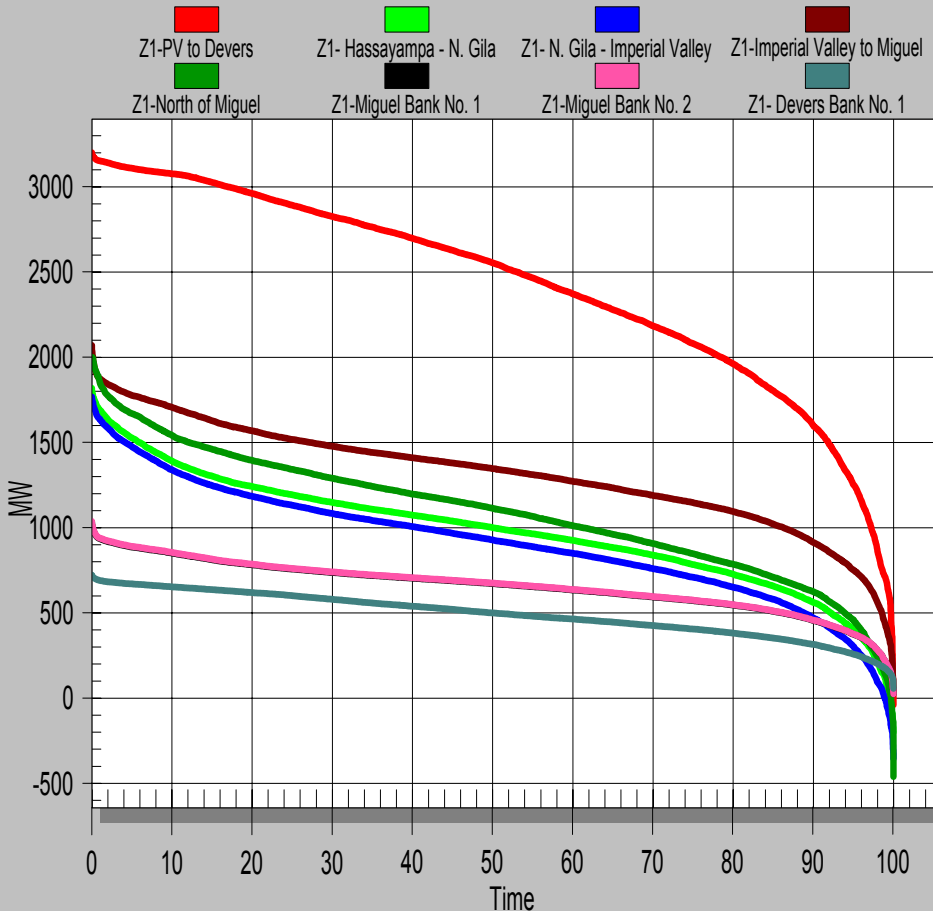
## Sensitivity 1: Otay Mesa, Palomar and Mountainview Generation Projects



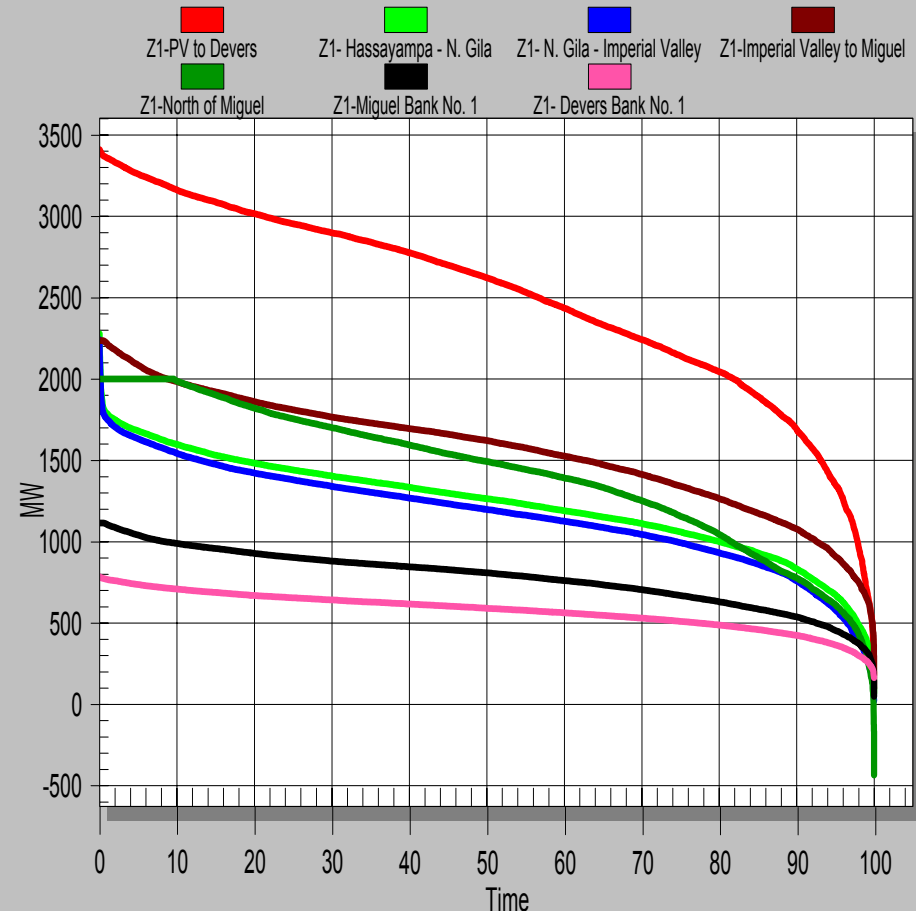


## Sensitivity 1: Otoy Mesa, Palomar and Mountainview Generation Projects

Sensitivity 1: Second Palo Verde - Devers with Palomar, OMGP and MV  
CA/AZ Major Transmission Facilities

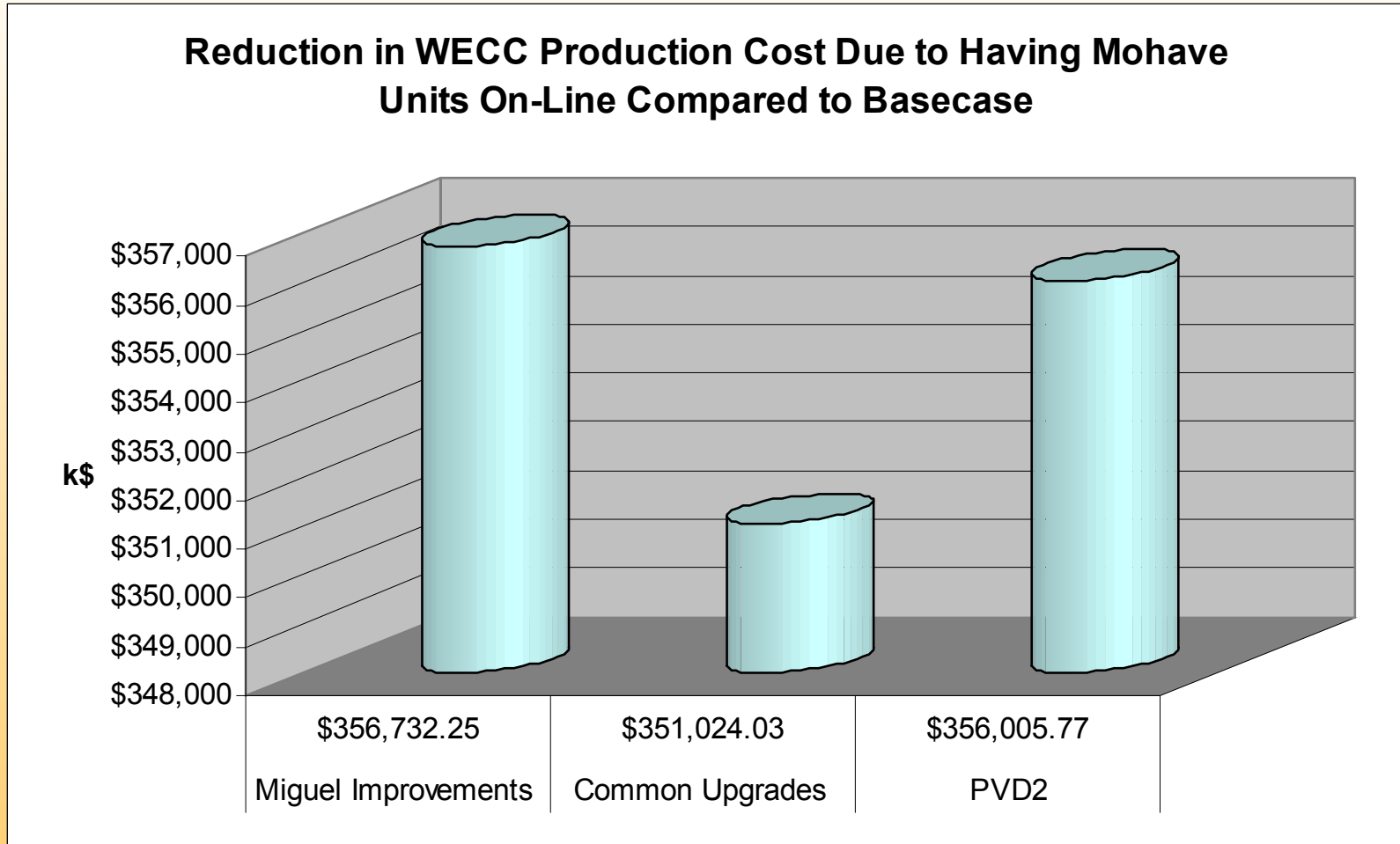


Case 5: Second Palo Verde - Devers Line  
CA/AZ Major Transmission Facilities



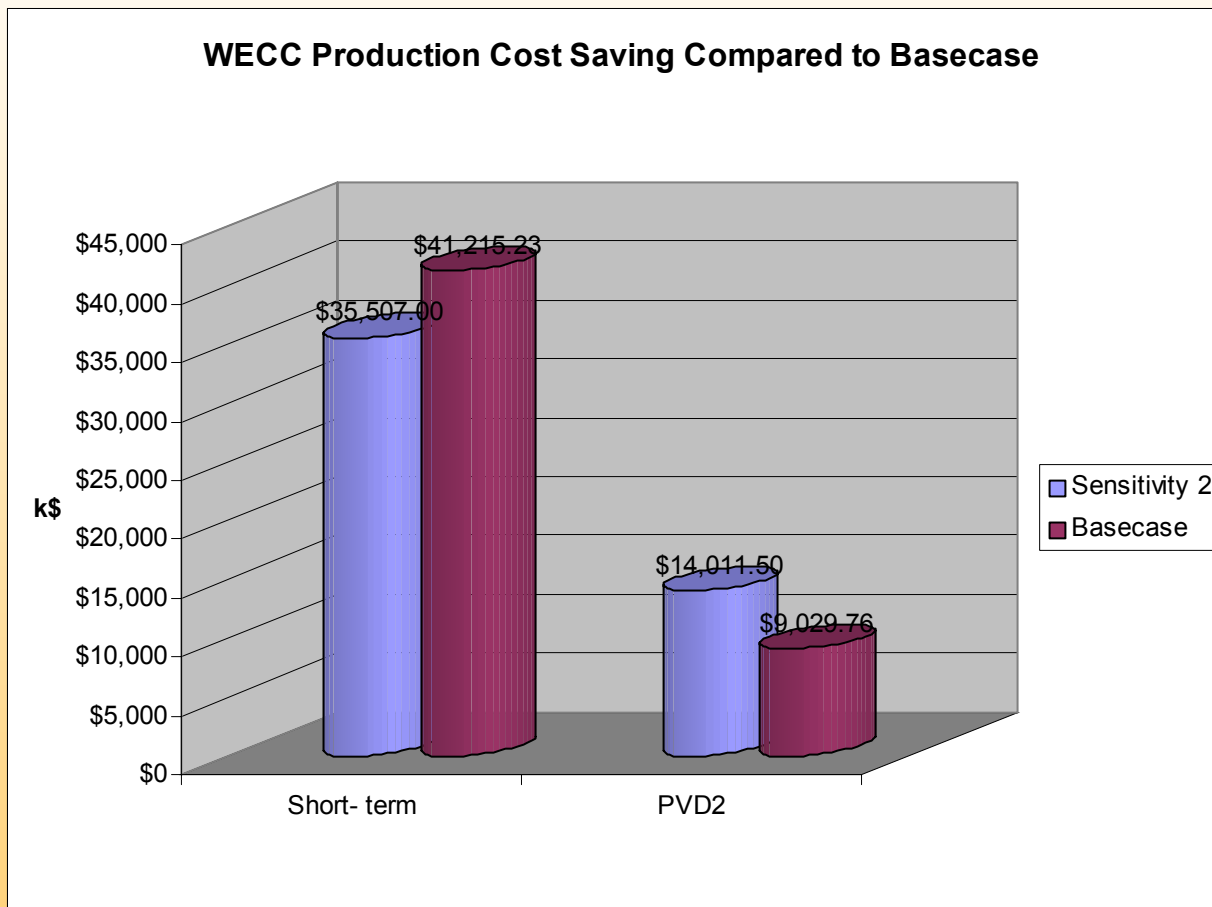


## Sensitivity 2: Mohave Units On Line





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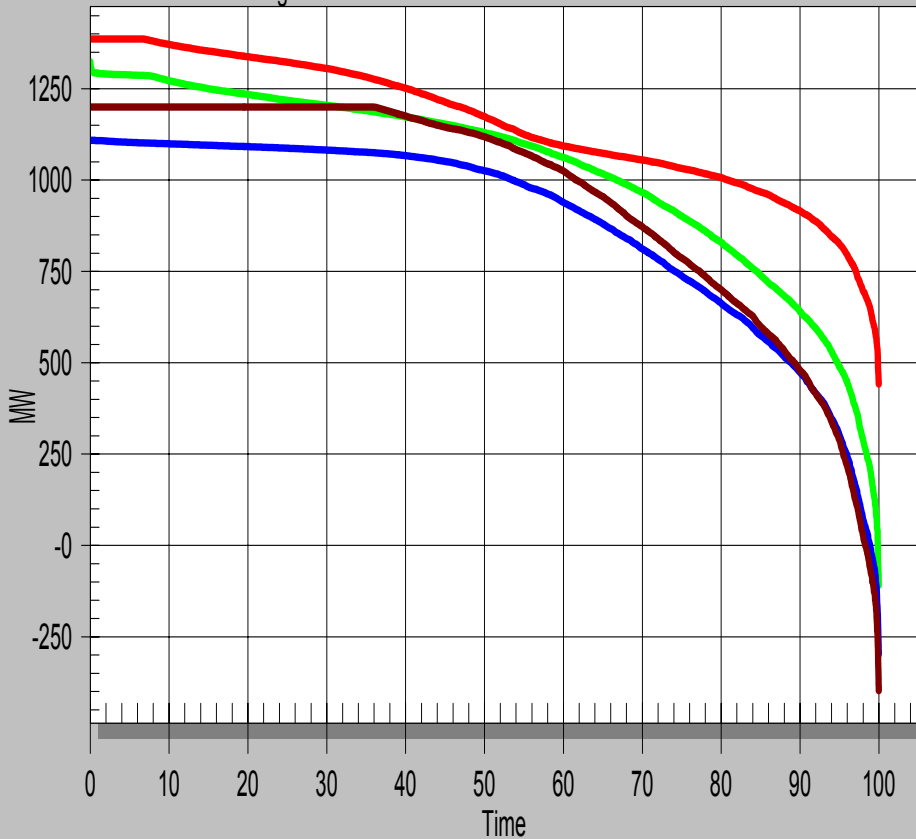




## Sensitivity 2: Mohave Units On Line

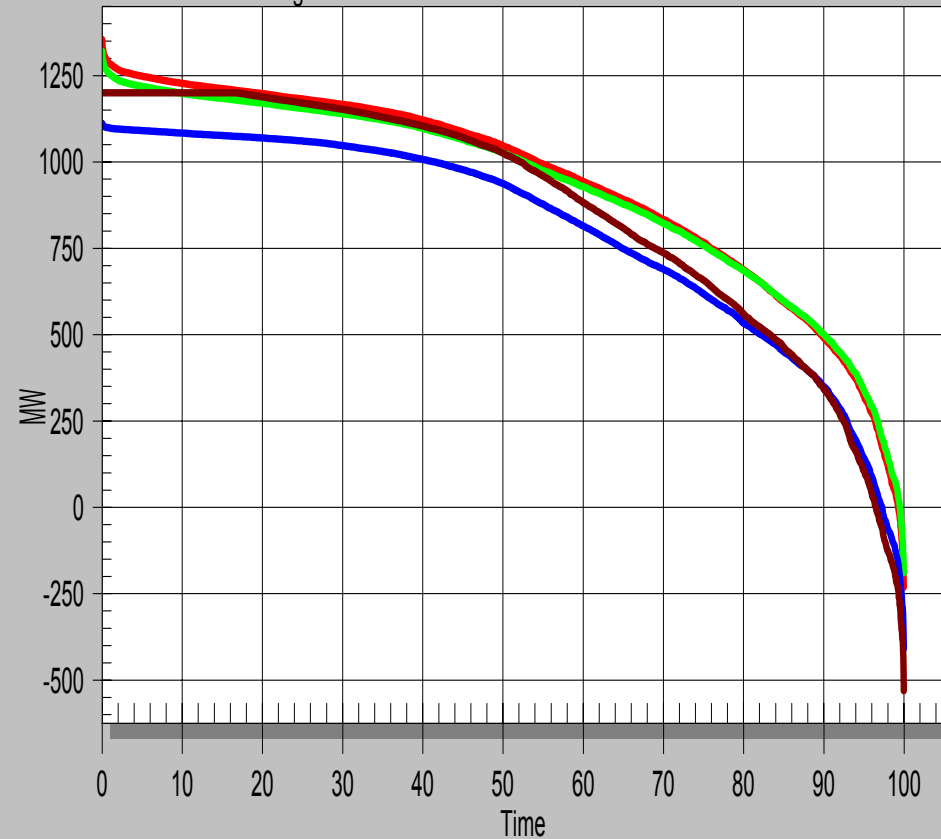
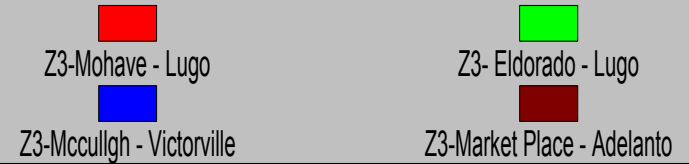
### Sensitivity 2: Common Upgrades with Mohave Units On-Line

NV/CA 500 kV Lines



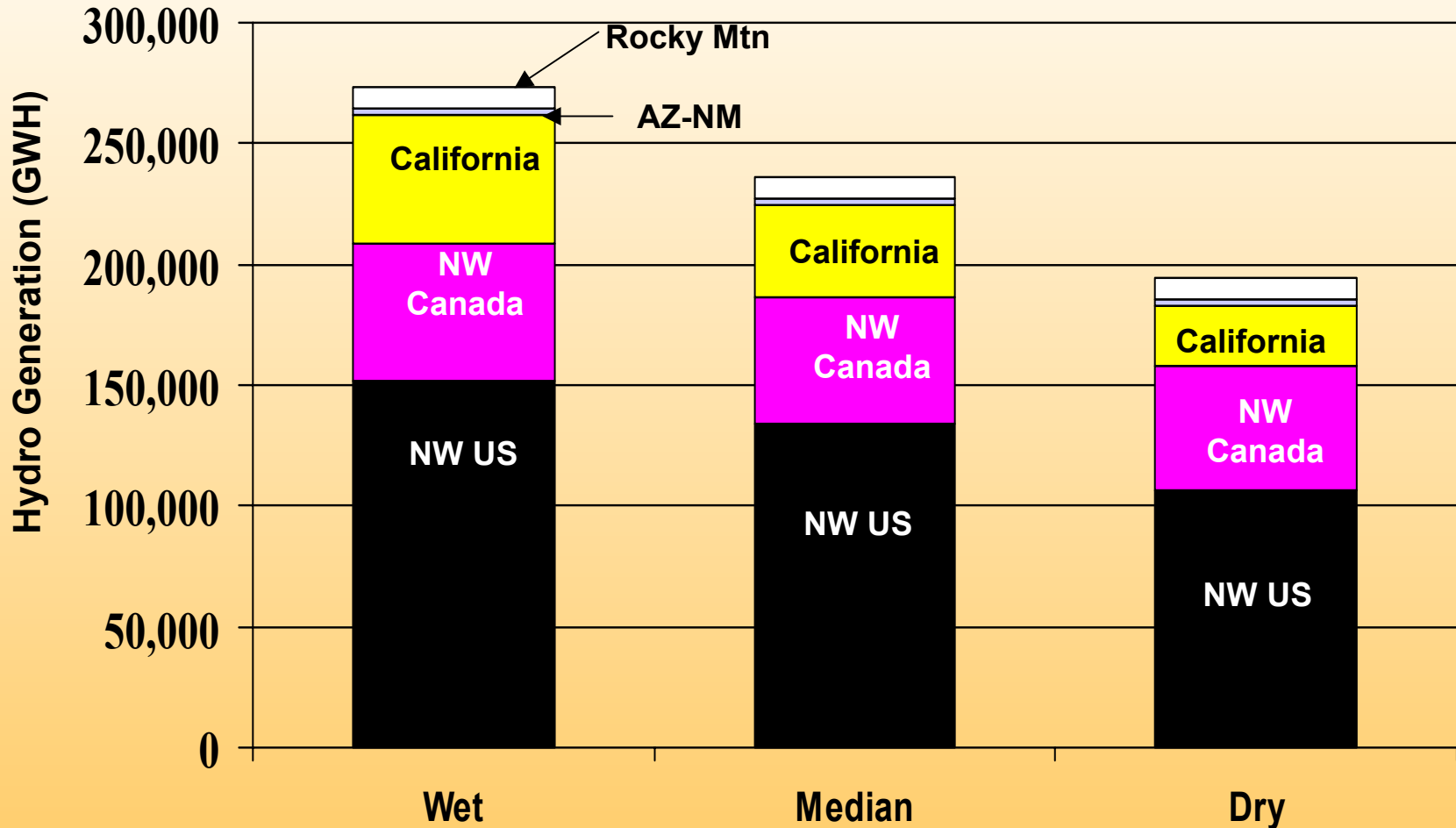
### Case 4: West of Devers Upgrade

NV/CA 500 kV Lines



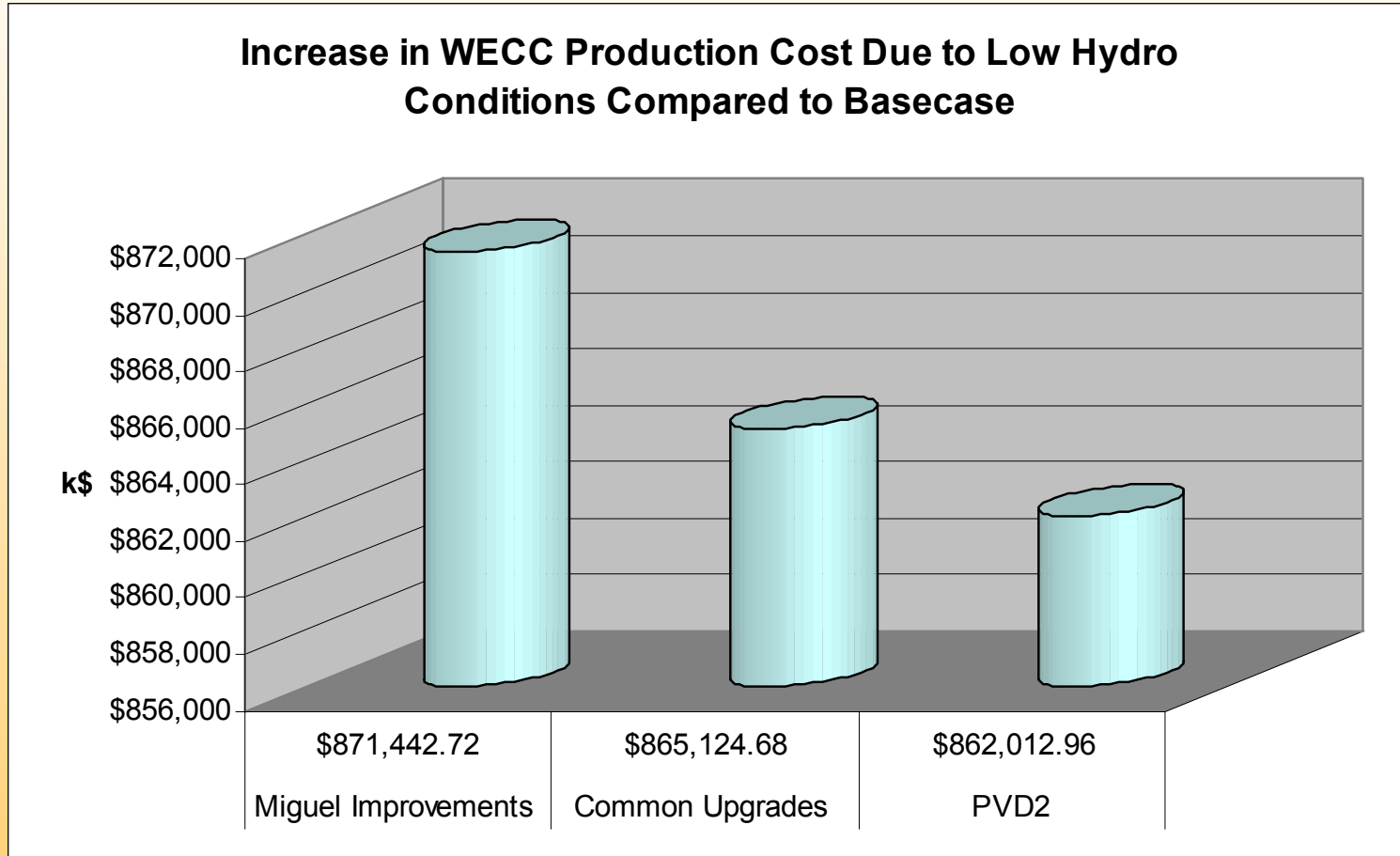


## Sensitivity 3: Low Hydro Conditions



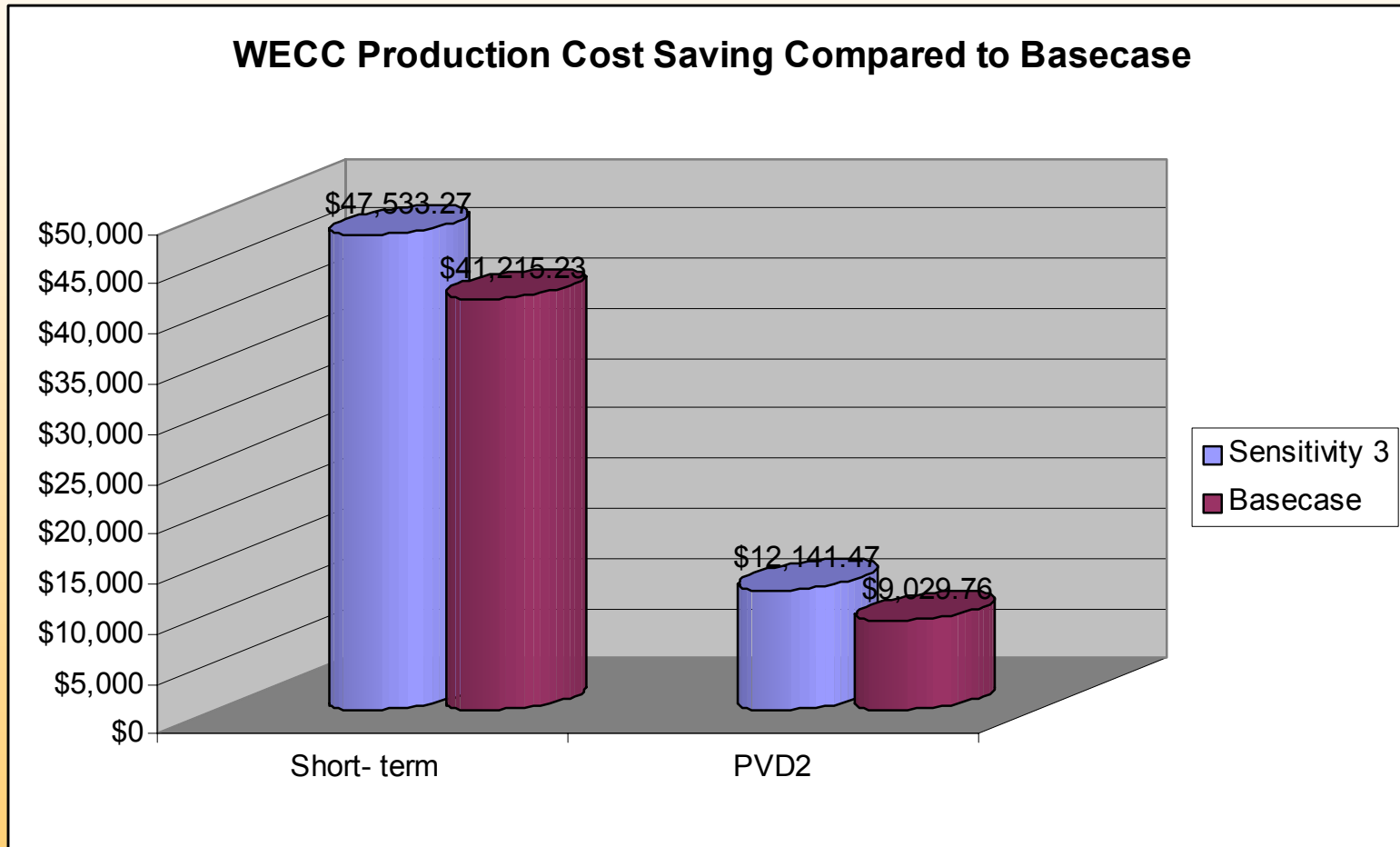


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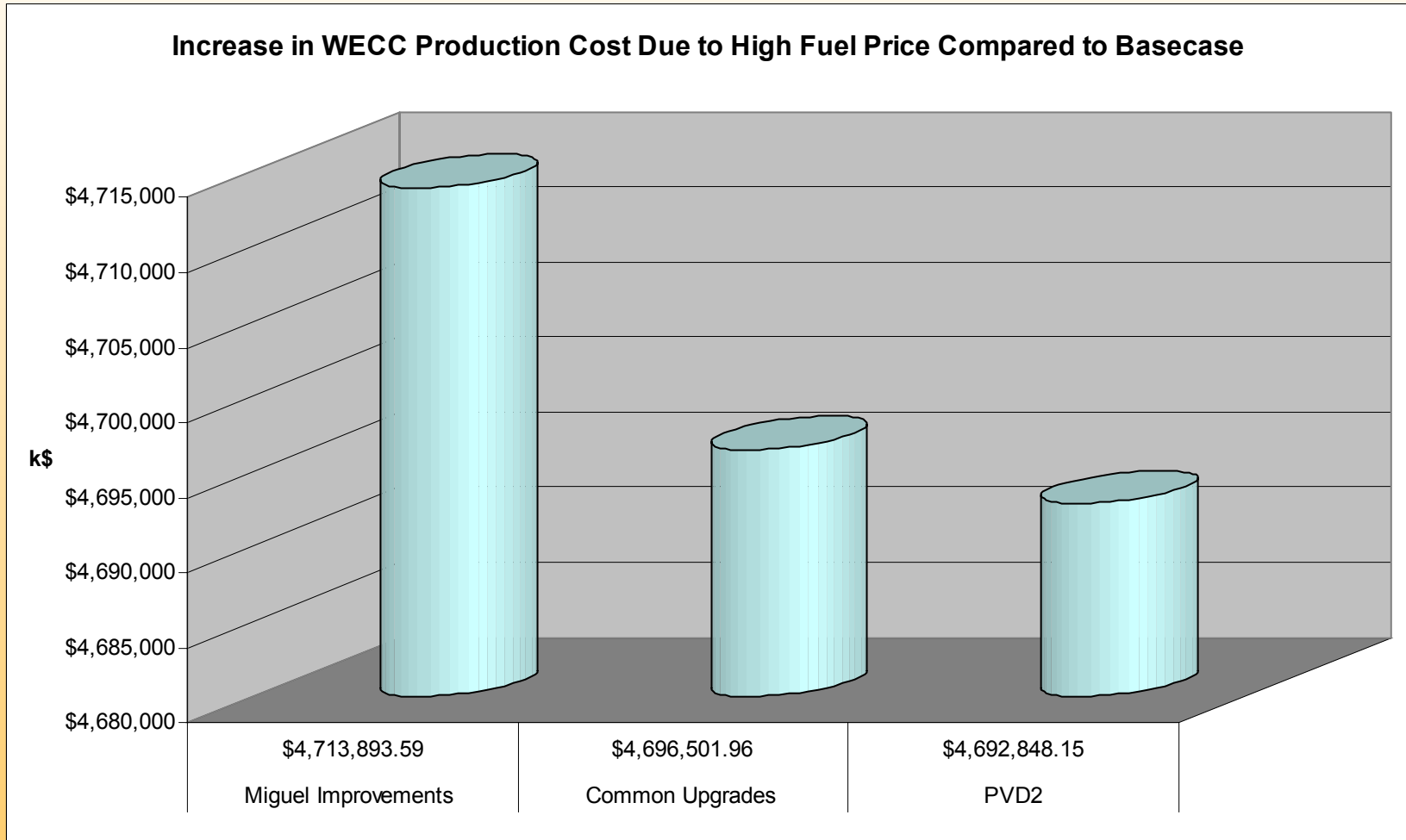


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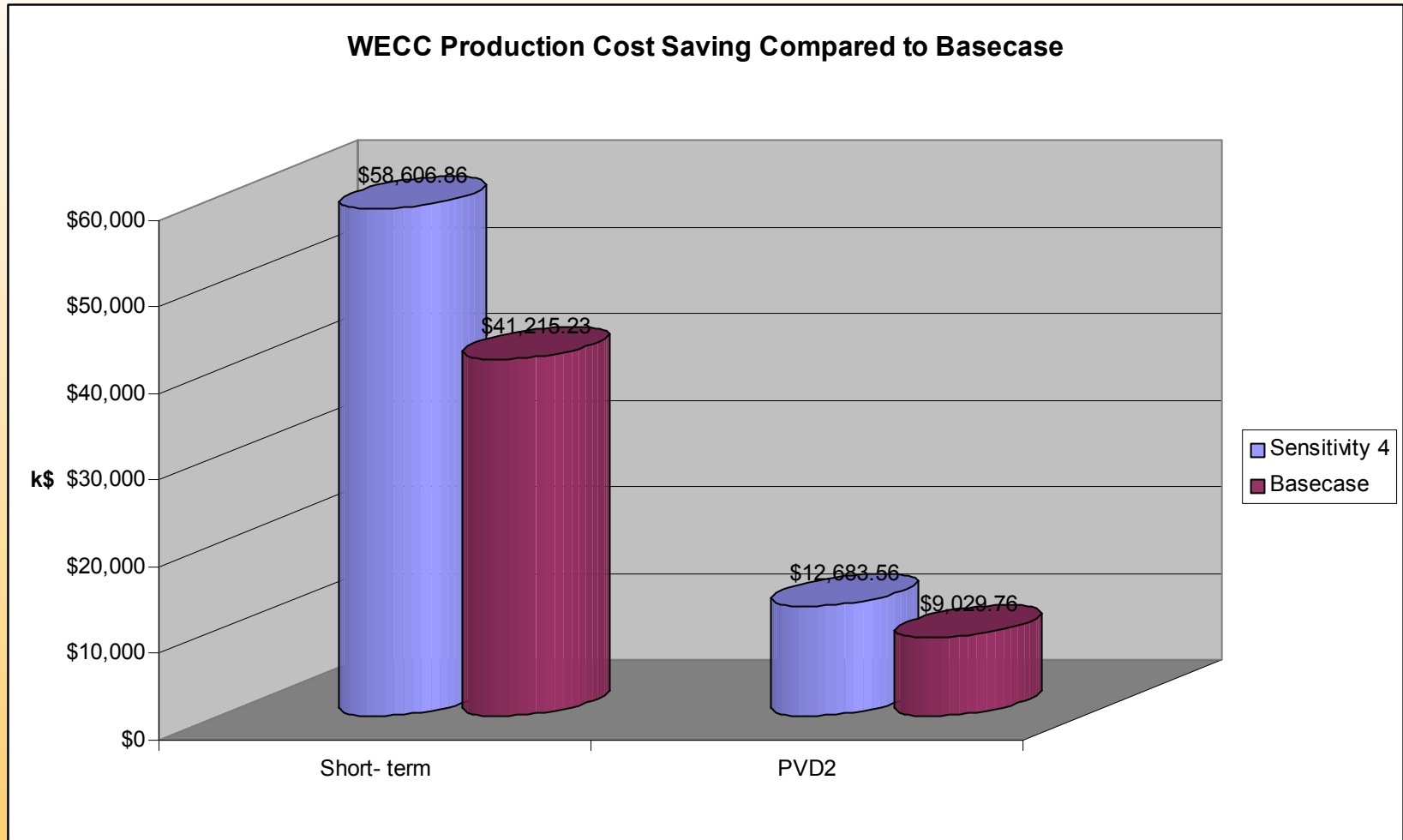


## Sensitivity 4: High Fuel Price (\$6)



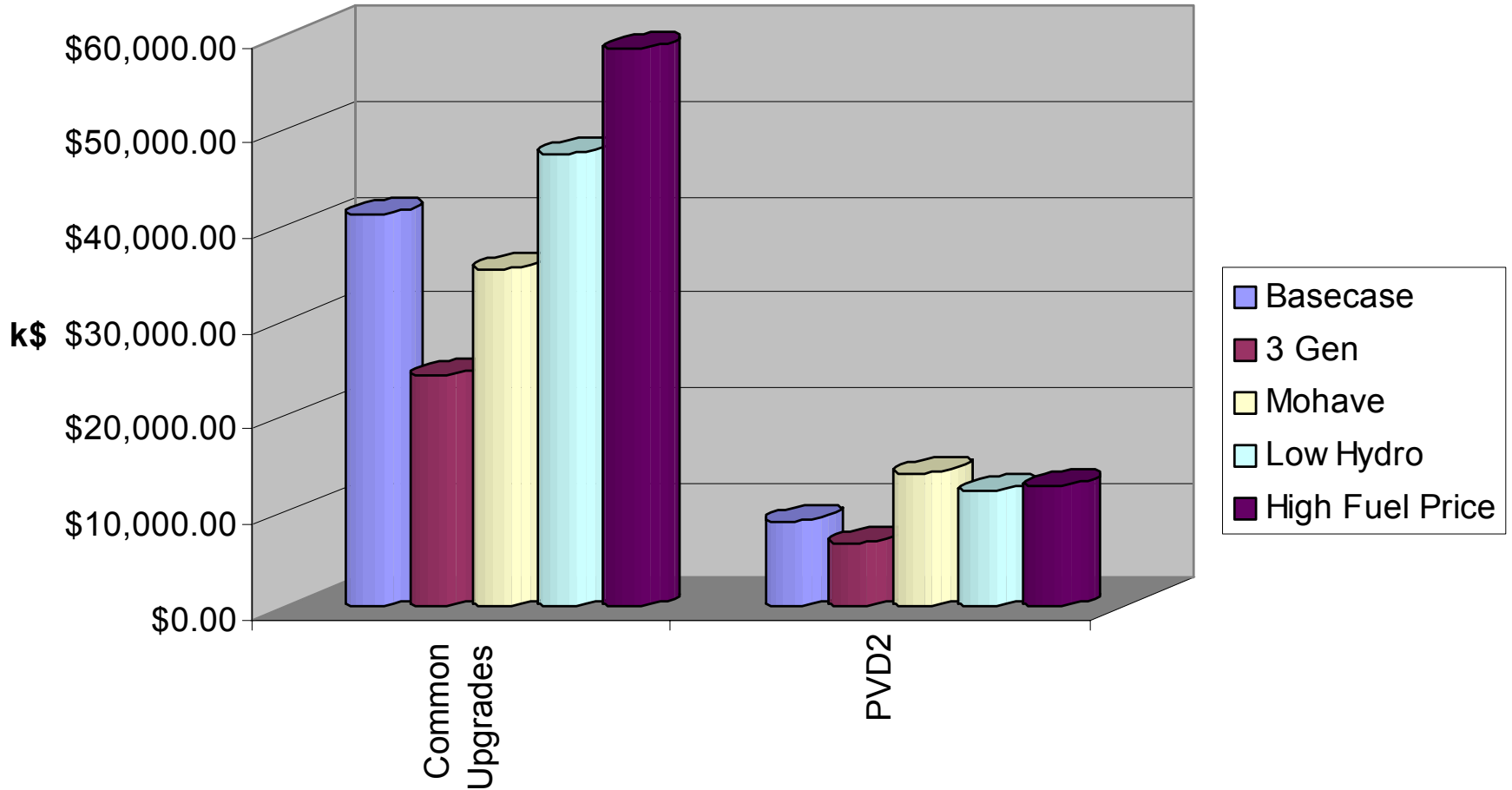


## Sensitivity 4: High Fuel Price (\$6)





## Savings in WECC Production Cost





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# Questions?