

Stakeholder Comments Template

CAISO 2012/13 Transmission Plan

February 11, 2013 Stakeholder Meeting Comments

Please submit comments to regionaltransmission@caiso.com by February 25, 2013.

Submitted by	Company	Date Submitted
Dave Schiada Karen Shea Dana Cabbell Jorge Chacon	Southern California Edison	February 25, 2013

Southern California Edison (SCE) appreciates the opportunity to comment on the CAISO's 2012-13 Draft Transmission Plan and discussions at the February 11, 2013 CAISO stakeholder meeting. SCE has the following comments on the CAISO's Draft Transmission Plan.

1) SCE Supports CAISO's Efforts for Summer 2013 and 2018

SCE appreciates the CAISO's action to approve SCE's proposed projects for summer 2013 whose costs are estimated to be under \$50 million (Barre–Ellis 230 kV reconfiguration, 80 MVAR capacitor banks at Johanna and Santiago 230 kV substations, and 160 MVAR capacitor banks at Viejo 230 kV substation). SCE is moving forward expeditiously on these projects. In addition, SCE supports the CAISO seeking approval for SONGS Static VAR Compensator (400 to 500 MVAR) at March Board of Governors Meeting pending the status of Huntington Beach synchronous condensers with an objective to meet a 2014 operating date, although that 2014 operating date is now unlikely.

2) Coolwater-Lugo Remains the Most Cost Effective Project

The following is a summary of SCE's key points regarding ZGlobal's "Comparative Economic and Reliability Study Final Report" (AV Clearview and Coolwater-Lugo projects) that was included in Critical Path Transmission's comments submitted to the CAISO on February 11, 2013.

- **Windhub Cannot Accommodate AV Clearview without Substantial Additional Costs and AV Clearview Project would create Significant Short Circuit Duty Concerns** – ZGlobal's Report assumes that the AV Clearview Project can be interconnected at SCE's Windhub Substation. Based on current generator interconnection requests, there are no open positions at Windhub to accommodate the interconnection of the AV Clearview Project. Furthermore, the connection of the two proposed transmission lines to Windhub under the AV Clearview Baseline alternative would result in significant short-circuit duty issues at Windhub Substation. Specifically, the alternative would exceed SCE's maximum open-air short circuit duty design at

Windhub Substation necessitating significant and costly actions, such as the complete demolition of the existing 220 kV switchrack and the construction of new Gas Insulated Switchgear (GIS) 220 kV facilities with increased rating. Upgrading Windhub for short-circuit duty issues would require extremely long-term curtailment of recently interconnected generation resources. These curtailments could potentially cause significant monetary losses associated with the lack of renewable production adversely impacting the RPS target goals, as well as significant cost of unnecessary work to convert the station to GIS.

- **ZGlobal Used Incorrect SPS Assumptions, Resulting in Misstated Deliverability for Coolwater-Lugo 220kV Project** - ZGlobal's study incorrectly assumed that SCE's SPS for the loss of the Lugo-Jasper 220 kV line would only trip 136 MW of generation in the Kramer area. Consistent with the CAISO's SPS guidelines, SCE's SPS is able to trip up to 1,150 MW of generation and thus the Coolwater-Lugo 220kV project provides for the delivery of approximately 1,000 MW of renewable generation, not 435 MW.
- **CAISO Reliability Criteria is met with Coolwater-Lugo 220kV Project** - ZGlobal claims that the AV Clearview project provides "significant reliability" benefits that Coolwater-Lugo 220kV cannot provide. However, ZGlobal's assertion ignores the obligation of the CAISO to identify the least cost solution to meet reliability criteria. Pursuant to Section 24.4.6.2 of the CAISO Tariff, the CAISO is obligated to identify projects needed to ensure system reliability and consider lower cost alternatives to meet those needs. Conversely, the CAISO tariff does not provide an open-ended invitation for the CAISO to approve projects (resulting in higher costs to customers) in order to meet a reliability standard beyond what is required by Applicable Reliability Criteria. The CAISO's studies have shown that the NERC, WECC and CAISO Reliability Standards are met with the Coolwater-Lugo 220kV project. The CAISO should ensure reliability requirements are met at a reasonable cost.
- **Unfounded Path 26 Congestion Relief Benefits** - ZGlobal states that the AV Clearview project provides potential congestion relief benefits on Path 26. However, the AV Clearview Project does not change the Path 26 rating, thus the AV Clearview Project itself does not provide congestion relief. If ZGlobal's assertion is that the AV Clearview Project allows additional dispatch of generation in South of Path 26, thereby lowering the cost of relieving potential congestion on Path 26, the same "benefit" would be attributable to the Coolwater-Lugo 220kV project as well.
- **Conclusion** – Despite the issuance of ZGlobal’s additional analysis, the CAISO’s original conclusion still holds – “the ISO found that the AV Clearview project did not produce economic transmission benefits that would offset the higher costs of the project relative to the Coolwater-Lugo 230 kV project costs.”¹ There has not been sufficient justification to revise the course approved by the CAISO over two years

¹ CAISO’s Draft 2012-2013 Transmission Plan, page 151.

ago in the generator interconnection process and codified through a signed Large Generator Interconnection Agreement². That course is to continue pursuing the Coolwater-Lugo transmission projects as any course changes at this stage could introduce uncertainty for this project.

3) Delaney-Colorado River Project

SCE appreciates the additional information provided by the CAISO as part of its stakeholder process. While SCE is still in the process of reviewing the economic analysis for the Delaney-Colorado River project, SCE would appreciate the CAISO's response to the following questions:

- **Backloading of Benefits** - It appears that approximately half of the overall benefits of the project are derived from escalation of last year (i.e., 2022) benefits 45 years into the future.³ Please see Appendix A below which shows that half of the benefits are from future escalation of the 2022 benefits. Given the uncertainty of variables like gas price forecasts, distribution generation penetration levels, demand response, other environmental factors, SCE requests the CAISO to confirm how much of the benefits are from the time period 2022 and beyond.
- **What is the generation mix in the WECC with and without the project?** How much of the generation being imported to California is fossil versus renewable generation?
- **What has been modeled for the split of renewables in California and out of California?** It appears that CAISO's production simulation results include approximately 20 TWH less generation for the California in-state RPS according to CAISO assumptions. SCE would appreciate clarification of this inconsistency, as an additional 20 TWH of California RPS could significantly reduce future imports.
- **Path 49 and 46 Rating Increases Due to the Devers-CR Project** - SCE began the WECC 3-phase rating process for the California portion of DPV2 (i.e. Devers-CR Project) to achieve 300 MW increase on Path 49 and 577 MW increase on Path 46, which is expected to be completed by mid-year 2013. Did the CAISO assume these rating increases in the economic analysis?

² As stated by the CAISO at the CAISO's February 2013 Board meeting, the CAISO cannot modify a signed LGIA through its transmission planning process.

³ See Appendix A below.

4) Eldorado-Lugo Upgrades Require Additional Studies and Consideration of Additional Alternatives Before Obtaining Board Approval

Additional studies and consideration of potential alternatives to the Draft Transmission Plan's recommendations should be pursued before CAISO seeks Board approval of the policy upgrades needed to accommodate the deliverability of additional renewable generation.

- ***Lugo-Eldorado Series Cap and Terminal Equipment Upgrade*** - SCE believes that an additional reliability related study must be conducted before this project can be recommended for Board approval. This upgrade was originally studied through the interconnection study process which focused strictly on thermal loading issues. Since the line would be operated at full compensation (70%), subsynchronous resonance (SSR) studies are required to evaluate potential impacts to generators and transmission equipment and systems. SCE requests that additional time be granted to allow for these studies and ensure that these upgrades would be installed reliably. In addition to completing the studies, SCE needs to further evaluate whether a 2016 operating date for this project is feasible.
- ***Reroute Lugo-Eldorado 500kV Line*** – SCE's believes that there are alternatives to rerouting the Lugo-Eldorado 500 kV line that should be further studied by the CAISO prior to the Board approving this project. SCE believes these alternatives would meet the same objective, have a shorter lead time, have less of an environmental impact, and could potentially be completed at a lower cost. SCE recommends these projects be moved to the CAISO 2013/14 Transmission Planning study to allow time to perform the additional evaluation.

Detailed Comments on ZGlobal's Analysis

SCE offers the comments below after reviewing the AV Clearview Analysis performed by ZGlobal and submitted along with Critical Path Transmission's comments submitted to the CAISO on 2/11/31.

I. Ratepayer Benefits

Assertion: Provide between \$267 and \$302 million in total annual benefits to ratepayers – approximately five to seven times the estimated \$44 to \$54 million in total annual ratepayer benefits from the Coolwater-Lugo 220kV Project;

Response: The basis for ZGlobal's estimated benefits is unclear: Is the ZGlobal Economic Benefit Analysis limited to the proposed transmission infrastructure (the AV Clearview Project or "Project") or does it also take into account assumed new renewable resources? The two proposed transmission lines connecting the proposed Yeager Substation to the existing Windhub Substation are not justified as discussed below. A more comprehensive report detailing exactly what is included in the analysis as well as how the results were determined needs to be provided.

- It appears as though the benefits analysis considered new renewable generation. Such generation could be interconnected to other locations within the existing system. The benefits analysis is inadequate as it represents an evaluation of interconnecting new resources and not an evaluation of the Project. The economic analysis should be limited to an evaluation of potential economic benefits resulting from the Project without the assumption of new resources.
- New renewable resources can physically interconnect to locations that do not require upgrades such as Whirlwind, Windhub, Antelope, Vincent, Red Bluff, Colorado River, etc.
- Therefore, since new renewable resources can be connected without the Project at other locations, there is no real Economic Benefit associated with the Project.
- The need for additional transmission capacity to deliver resources from Windhub Substation and Whirlwind Substation has not yet been identified as part of ongoing Generation Interconnection studies.
- This finding encompasses a total of 3,823 MW seeking interconnection or already interconnected to the Windhub Substation, and a total of 3,759 MW at Whirlwind Substation.

- There is no room at Windhub to accommodate the interconnection of the double circuit 220kV from Yeager. Interconnection would require a Substation Expansion, which would impact newly installed facilities to support wind turbines; and/or possible condemnation of land controlled by generation developers seeking to install more wind turbine generators or photovoltaic resources between wind turbine rows. (E.g. Western Wind to the east and Alta Wind Power to the west).



- The proposed connection to the Windhub 230 kV is not justified because requirements have not been identified for delivering the total 7,582 MW of resources from these two substation locations.
- For the Northern Area resources, studies have identified that with the completion of TRTP, the next major choke points requiring additional capacity would be South of Vincent and South of Lugo. The AV Clearview Project does not increase capacity at either of these two points as it is located north of Vincent and north of Lugo.
- The connection of the two proposed transmission lines to Windhub under the AV Clearview Baseline alternative would result in significant short-circuit duty

issues. Specifically, the alternative would exceed SCE's maximum open-air short circuit duty design at Windhub Substation necessitating significant and costly actions, such as the complete demolition of the existing 220 kV switchrack and the construction of new Gas Insulated Switchgear (GIS) 220 kV facilities with increased rating.

- Upgrading Windhub for short-circuit duty issues would require extremely long-term curtailment of recently interconnected generation resources. These curtailments could potentially cause significant monetary losses associated with the lack of renewable production adversely impacting the RPS target goals as well as cost in excess of \$100 million of unnecessary work to convert the station to GIS.
- All evaluations associated with accommodating delivery should be limited to delivery of resources out of Kramer as the line segment to Windhub is unjustified.

II. Renewables

Assertion: The AV Clearview Project can accommodate the interconnection and delivery of approximately three times the new renewable generation of the Coolwater-Lugo 220kV Project (1,370 MW vs. 435 MW);

Response: ZGlobal incorrectly assumed that the associated SCE Special Protection System (SPS) for Lugo-Jasper 220 kV T/L N- would only trip up to 136 MW.

- This assumption is incorrect, as the CAISO SPS guideline, ISO SPS3, allows up to 1,150 MW of generation to be tripped as part of an N-1 outage; therefore, the Coolwater-Lugo 220KV Project will be able to deliver approximately 1,000 MW of new renewable generation.
- As stated in the CAISO's Draft 2012-2013 Transmission plan, the Coolwater-Lugo 220KV Project ensures the deliverability of the 750 MW of renewable generation in the Kramer zone and the 106 MW in the Lucerne zone, in the Commercial interest portfolio⁴.

III. Reliability and Congestion Relief

Assertion: The AV Clearview Transmission Project provides significant reliability benefits that the Coolwater-Lugo 220kV Project cannot itself provide, including: VAR support,

⁴ <http://www.caiso.com/Documents/Draft2012-2013TransmissionPlan.pdf>

relieving potential congestion on Path 26, and relieving longstanding N-2 contingencies in the Kramer area;

Response: The current system in place is adequate to support all existing load demand and installed generation. In particular, SCE address the following three areas: VAR support, Path 26 congestion relief, and N-2 contingencies in the Kramer area.

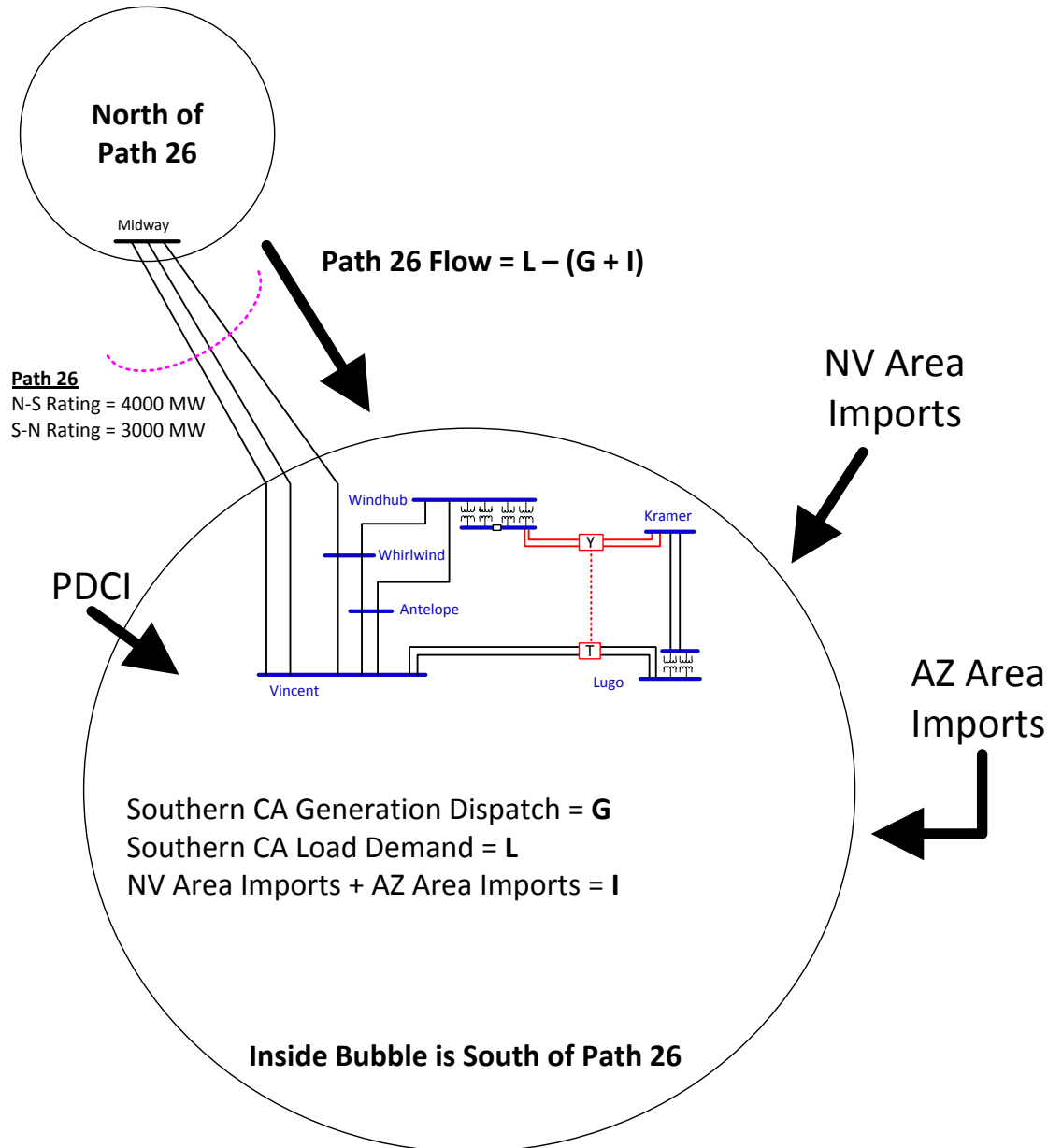
a) VAR Support Assertion

- ZGlobal's claim that the Kramer system needs reliability or VAR support is unfounded.
- SCE neither has a voltage problem in the Kramer Area, nor in the Windhub, Whirlwind, Lugo, or Northern Areas that identified or warranted the need for additional VAR Support.
- SCE does not agree that such VAR support can be claimed as a benefit since there is nothing requiring such VAR support.

b) Relief to Potential Congestion on Path 26 Assertion

- The AV Clearview project does not increase capacity on Path 26. These claimed benefits are not associated with the AV Clearview project itself but with the dispatch of assumed generation resources.
- Congestion on Path 26 is based on the scheduled flows across the path. Southbound congestion occurs when scheduled flows exceed 4,000 MW and northbound congestion occurs when schedule flows exceed 3,000 MW.
- The exceedance of the flows in either direction is the direct function of the load demand and generation dispatch North and South of Path 26.
- Southbound congestion will occur when total Load demand in the South exceeds both the Generation dispatch in the South and Imports from all other Paths (excluding Path 26).
 - Congestion occurs when: $L - (G + I) > 4000MWs$.
- There are presently three ways in which congestion on Path 26 can be addressed:
 - Load: Lowering the load demand.
 - Generation: Increasing Generation dispatch levels south of Path 26

- Imports: Increasing the Imports outside of Path 26.
- Alternatively, Path 26 congestion may be alleviated by increasing the current Path 26 capability by increasing the Path 26 rating:
 - (e.g. $L - (G + I) > 4000MW_S + (\text{additional capacity})$)



Note: System Losses are assumed to be part of L

- The Project does not increase imports outside of Path 26.
- The Project is not changing the load demand.

- Therefore, ZGlobal's analysis of the Project appears to only add new Generation
- Claimed benefits are not associated with the Project itself. The same benefits could be attained by turning on generation seeking interconnection to Whirlwind, Windhub, Colorado River, Red Bluff, or any other location where generation can be connected without the project.
- This project does not increase the Path Rating and, as such, cannot possibly relieve congestion management on the path. Electrically, the project is located south of Path 26 so there is no benefit to Path 26.
- To address congestion on Path 26 and make a claim to such benefit, the project must be able to increase the rating of Path 26 (i.e. the pipeline needs expanding to be able to handle more than 4000 MWs).

c) Relieve Longstanding N-2 contingencies in the Kramer Area Assertion

- While it is true that adding more generation drives the need for more wire, the need for new wire is not to address a reliability concern.
- The Coolwater-Lugo 220 kV T/L is classified as a deliverability upgrade and not a reliability upgrade in the generation interconnection study process. The T/L is intended to make Q125 fully deliverable to the grid. The Coolwater-Lugo 220 kV T/L is not meant to fix a reliability problem because such problem does not exist. The existing Kramer system already meets all applicable reliability standards and as such is defined to be reliable.
- To enable Energy Only status interconnection of the project in Q125 in a manner that meets all applicable reliability standards, the project is being added to a Special Protection System as allowed by the Planning Standards. Portions of the SPS are classified as reliability upgrades triggered by the generation project and would not be needed but for the interconnection of the new generation project in advancement of the identified deliverability upgrades.
- All contingencies, including the longstanding N-2, have approved mitigation in place so nothing new is needed to ensure the system meets the NERC/WECC required Planning Standards.

- It is important to note that the inclusion of the Project would create what will become a new longstanding N-1 Contingency problem – with the loss of the DC line from Yeager to Tucker. A new line such as this would necessitate the need for a more complex SPS than the one currently in place.
- Consequently the statements of the Project addressing longstanding N-2 contingency issues should be considered in the context of the creation of a new, more severe N-1 problem that is more likely to happen.
- Benefits that create additional problems, such as the resulting N-1: Yeager-Tucker Contingency, should not be claimed. The existing system meets all applicable planning criteria.

Any and all benefits pertaining to reliability, congestion relief, and contingency mitigation are unfounded, and furthermore, are not required to meet all applicable planning criteria.

IV. Timing

Assertion: Critical Path asserts that the AV Clearview Project can be in service two years before the Coolwater-Lugo 220kV Project.

Response: SCE will have to permit all work needed within the Windhub and Kramer Substations as well as the 500 kV switchrack required to loop the existing Lugo-Vincent 500 kV transmission line at the proposed Tucker Substation. Additionally, new facilities, such as telecomm infrastructure, will be needed to support the new Yeager and Tucker Substations. Therefore, AV Clearview's timeline is uncertain.

V. Cost

Assertion: SCE has extraordinary cost deviations from the original estimates on the TRTP and Devers-Colorado River projects, thus CAISO should update cost estimate for Coolwater-Lugo project.

Response: SCE is reviewing cost data for the Coolwater-Lugo 220KV Project and will further address this issue in its February 25 comments. It should be noted that the upper bound of the AV Clearview Project cost went from \$800 million in the CAISO 12/11/12 Stakeholder Presentation to \$1.19 billion in the 02/01/13 Draft 2012-2013 Transmission Plan.

VI. General SCE Transmission Planning Comments

- The ZGlobal reliability assessment was not performed according to NERC Reliability Standards, WECC Regional Business Practices, and CAISO Planning Standards and is therefore inadequate. In addition, no base cases, power flow plots, or stability plots were provided to justify the ZGlobal report findings.
- Regarding environmental disturbance, the AV Clearview Project would require at least 78 miles of new ROW (using straight line distances only), while the Coolwater-Lugo 220KV Project would only need approximately 40 miles of new ROW. In addition, the AV Clearview would require land for two AC/DC substations (Yeager and Tucker) and one AC Substation (rebuilding SCE's Edwards 115 kV Substation), while the Coolwater-Lugo 220KV Project would only require land for one AC Substation (Desert View).
- The AV Clearview Project will be constructing part of their project underground, which creates more environmental disturbance, has longer outage and repair times, and has a shorter life expectancy than overhead construction.

Detail Comments on Appendix B of Draft Transmission Plan

The Mitigation section provides three solutions (Install shunt reactor in Control area, SPS to shed load at Control 55 kV, and installing shunt capacitors at the Tortilla substation) for ambiguously stated problems.

The recommended step of a new SPS to shed load at Control 55 kV to address the potential reliability concern for the simultaneous outage of the two Control 115/55 transformers is unjustified as the N-2 situation is unlikely to occur. Other alternatives should be considered.

Furthermore, installing shunt reactors in the Control area to mitigate the voltage concerns for the outage of Casa Diablo-Control 115 kV #1 and Casa Diablo-Sherwin-Control 115 kV #1 transmission lines would adversely impact Fish Lake Valley and surrounding areas, as there are known low voltage concerns in the area. This mitigation should be further evaluated jointly between SCE and the CAISO before a recommendation is made.

Appendix A

Delany - Colorado River Transmissison benefits

Simulated CASIO benefit calculations			
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Discount rate = 7.0%	Discount rate = 7.0%
escalation rate = 1.42%	escalation rate = 0.42%

0 year NPV of benefits \$1,070	NPV of benefits \$973
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		Benefits (millions)				Benefits (millions)	
1	2017	68	*	1	2017	68	
2	2018	68	**	2	2018	68	
3	2019	68	**	3	2019	68	
4	2020	68	**	4	2020	68	
5	2021	68	**	5	2021	68	
6	2022	68	*	6	2022	68	
7	2023	69	***	7	2023	68	
8	2024	70		8	2024	69	
9	2025	71		9	2025	69	
10	2026	72		10	2026	69	
11	2027	73		11	2027	69	
12	2028	74		12	2028	70	
13	2029	75		13	2029	70	
14	2030	76		14	2030	70	
15	2031	77		15	2031	71	
16	2032	78		16	2032	71	
17	2033	79		17	2033	71	
18	2034	81		18	2034	72	
19	2035	82		19	2035	72	
20	2036	83		20	2036	72	
21	2037	84		21	2037	72	
22	2038	85		22	2038	73	
23	2039	86		23	2039	73	
24	2040	88		24	2040	73	
25	2041	89		25	2041	74	
26	2042	90		26	2042	74	
27	2043	91		27	2043	74	
28	2044	93		28	2044	75	
29	2045	94		29	2045	75	
30	2046	95		30	2046	75	
31	2047	97		31	2047	76	
32	2048	98		32	2048	76	
33	2049	100		33	2049	76	
34	2050	101		34	2050	76	
35	2051	102		35	2051	77	
36	2052	104		36	2052	77	
37	2053	105		37	2053	77	
38	2054	107		38	2054	78	
39	2055	108		39	2055	78	
40	2056	110		40	2056	78	
41	2057	111		41	2057	79	
42	2058	113		42	2058	79	
43	2059	115		43	2059	79	
44	2060	116		44	2060	80	
45	2061	118		45	2061	80	
46	2062	120		46	2062	80	
47	2063	121		47	2063	81	
48	2064	123		48	2064	81	
49	2065	125		49	2065	81	
50	2066	126		50	2066	82	

*modelled
 **linear interpolation
 * assumes growth at escalation

Example of diminished future benefits			
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Discount rate = 7.0%	Discount rate = 7.0%
escalation rate = 0.0%	escalation rate = 0.0%

NPV of benefits \$504

		Benefits (millions)	
1	2017	68	
2	2018	68	
3	2019	68	
4	2020	68	
5	2021	68	
6	2022	68	
7	2023	62	****
8	2024	56	
9	2025	50	
10	2026	44	
11	2027	38	
12	2028	32	
13	2029	26	
14	2030	20	
15	2031	14	
16	2032	8	
17	2033	2	
18	2034	0	
19	2035	0	
20	2036	0	
21	2037	0	
22	2038	0	
23	2039	0	
24	2040	0	
25	2041	0	
26	2042	0	
27	2043	0	
28	2044	0	
29	2045	0	
30	2046	0	
31	2047	0	
32	2048	0	
33	2049	0	
34	2050	0	
35	2051	0	
36	2052	0	
37	2053	0	
38	2054	0	
39	2055	0	
40	2056	0	
41	2057	0	
42	2058	0	
43	2059	0	
44	2060	0	
45	2061	0	
46	2062	0	
47	2063	0	
48	2064	0	
49	2065	0	
50	2066	0	

****assumes benefits decrease
 by \$6 million/yr until gone