

**TRAN-1**

**ITEM TRAN-1**  
**RENEWABLE ENERGY CONCEPTUAL TRANSMISSION PLAN**

**This Renewable Energy Conceptual Transmission Plan is not intended to request any funds for construction or is it intended to request Commission approval of any facilities associated with this Renewable Energy Conceptual Transmission Plan.**

In response to the requirements provided in Assembly Bill 387 and the proposed regulations in the Commission's rulemaking Docket No. 09-07010 regarding the development of transmission facilities to serve renewable energy zones within the State of Nevada, the Companies have prepared the following Renewable Energy Conceptual Transmission Plan ("RECTP").

The plan includes specific proposals for the initial development of specific transmission infrastructure facilities, such as the ON Line project, and permitting and right of way acquisition activities for transmission corridors needed to access the Commission designated renewable energy zones and deliver such resources to load centers in Southern Nevada and/or California and the Desert Southwest. Later, the plan provides for the potential joint development of 500 kV bulk transmission lines needed to serve the geographically dispersed zones and deliver them to the referenced load centers. The plan also provides for "feeder" or "collector" lower voltage lines and/or substations to gather renewable resources within the zones and deliver them to the bulk transmission facilities. In addition, where required, *e.g.*, in the Las Vegas area, the plan will need to include transmission improvements to lower voltage transmission facilities (*e.g.*, 230 kV) to allow the resources to be distributed to the ultimate loads.

In addition to serving the renewable energy zones, three general transmission objectives are included in the general conceptual design of the transmission system. First is to connect the two utilities. This is accomplished first with ON Line. The addition of a Westside Tie strengthens the connection for outage conditions like outages of ON Line and improves system reliability. Second, is to reinforce the existing transmission as opposed to rebuilding it as much as possible. The 230 kV system is very weak, but can be useful to the State if proposed generation along the 230 kV line between Ft. Churchill and Gonder has additional paths to loads. The third is the Westside transmission line into the Reno-Carson area to support long term load service and flexibility.

The Companies are presenting this RECTP based on their extensive experience derived from participation in a number of different efforts investigating strategies for developing transmission infrastructure needed to support renewable energy resources. These efforts have included: (1) participation in the Company's own Renewable Portfolio Standard ("RPS") development; (2) participation in Nevada's Renewable Energy Transmission Access Advisory Committee ("RETAAC") renewable zone definitions; (3) interconnecting renewable resources into the Companies' transmission systems resulting from Open Access Transmission Tariff ("OATT") generator interconnection requests; (4) preparing responses to state policy makers interested in exporting renewable resources, such as the Department Of Energy ("DOE"); (5) participation in the Bureau of Land Management ("BLM") corridor designation processes, Western Governors' Association ("WGA") Western Renewable Energy Zone ("WREZ") identification process; (6) BLM lease grant requests; and (7) the BLM's Solar Energy Development Programmatic

Environmental Impact Statement (“PEIS”) process. To date these efforts have resulted in the Companies obtaining a Statement of Interest (“SOI”) from the Western Area Power Administration (“Western”), followed by execution of an announced Memorandum of Understanding (“MOU”) with Western Area Power Administration (“Western”).

The timing of the conceptual transmission plan is driven largely by generation interconnection requests and agreements, transmission service requests, developers’ interests, the potential participation of Western in the TCP (as described below) corridor project, and later the Westside Tie. Accordingly, the timing of these projects is not under Sierra’s or Nevada Power’s direct control. Refinements in the conceptual transmission plan should be expected over time as better information is obtained. The plans presented here are options for generation interconnections and system reinforcements to connect the estimated energy zone generation presented in the RETAAC report. They are not proposed for construction, but are conceptual system improvements.

An integrated renewable resource and transmission planning process will assist in the development of transmission infrastructure designed to aid in the development of renewable energy resources within the state. The Companies are providing this RECTP to provide concepts for transmission planning to integrate renewable resources.

## I. GENERAL OVERVIEW

To meet the Companies’ goals, and state and federal policies, the Companies have proposed a three part strategy for developing a robust, flexible, and scalable bulk transmission system. The elements of that strategy are as follows:

1. Construct the ON Line project. This project allows for the initial transfer of approximately 600 MW of renewable energy in the base configuration, and up to 2,000 MW in its ultimate build-out. This line will allow for transfers of renewable energy between Sierra Pacific Power Company (“Sierra”) and Nevada Power Company (“Nevada Power”), will provide access for additional renewable resources (predominantly wind generation) in the Ely area, will cross through solar-rich properties in Lincoln and Clark counties,<sup>1</sup> and provide access to Nevada Power’s system at the Harry Allen Substation.
2. Permit Harry Allen to Northwest 500 kV and Northwest to Amargosa 500 kV transmission corridors. If permitted, these corridors will form the first leg of a Westside Tie line as proposed by the RETAAC and discussed in the Companies’ SOI with Western. These corridors provide access from the premier solar locations in the Amargosa Valley into Nevada Power’s system at the Harry Allen Substation. Through the PEIS process, the BLM has identified a potential of 6,500 to 11,500 MW<sup>2</sup> of solar generation (Figure TRAN-1 1) within the Amargosa Valley and from resources north toward Tonopah. The Company has

---

<sup>1</sup> The BLM’s PEIS has identified potential of 9,400 to 18,300 MW of renewable generation along the ON Line path. This number represents a sum of the ranges of the four identified areas along the path of the ON Line (the Delamar Valley, Dry Lake, Dry Lake North and East Mormon Mountain).

<sup>2</sup> This number represents a sum of the ranges for the three identified areas along the West side tie line (Amargosa Valley, Gold Point, and Millers)

requested a corridor from Northwest Substation into the Amargosa Valley for a minimum of two lines (500 kV and 230 kV) in order to provide scalability options. This corridor would represent the first leg of the West Tie, which would provide a second strong transmission tie to northern Nevada renewable resources. Depending on Western's identification of need, this corridor also could form the first leg of a Western export supply route linking northern California to southern California, and other markets in the Desert Southwest.

**Figure TRAN-1 1**  
**Excerpts from BLM PEIS data**

<b>SOLAR ENERGY STUDY AREAS</b>			
		<b>MW Capacity if</b>	
		<b>Fully Developed</b>	
<b><u>STUDY AREA NAME</u></b>	<b><u>Acres</u></b>	<b><u>Low MW</u></b>	<b><u>High MW</u></b>
Amargosa Valley NV <sup>18</sup>	32,699	3,633	6,540
Delamar Valley NV <sup>17</sup>	17,932	1,192	3,586
Dry Lake NV <sup>17</sup>	16,516	1,835	3,303
Dry Lake Valley North NV <sup>17</sup>	49,775	5,531	9,955
East Mormon Mountain NV <sup>17</sup>	7,418	824	1,484
Gold Point NV <sup>18</sup>	5,830	648	1,166
Millers NV <sup>18</sup>	<u>19,205</u>	<u>2,134</u>	<u>3,841</u>
Total Nevada	149,375	15,797	29,875

Note: Also see Map in Figure TRAN-1 2

The proposed Harry Allen to Northwest and Northwest to Amargosa Valley transmission corridors are shown in Figure TRAN-1 13 below.

3. Permit Harry Allen to Eldorado 500 kV transmission corridor. This last link in the three part strategy will provide expanded access from the Harry Allen substation to substations in the Eldorado Valley, in particular, the jointly owned Eldorado substation, and potentially Western's Mead substation. The majority of renewable power import and export transactions are expected to occur at these two substations. The combination of the ON Line in the east and the proposed corridors along with the Westside tie will allow the Companies to access the full menu of renewable resources available in Nevada (solar, wind and geothermal) and deliver them to loads in Nevada and perhaps to markets in California and the Desert Southwest. In this fashion the costs of the needed transmission facilities can be shared with customers in other markets rather than being borne exclusively by Nevada's ratepayers. Without an export outlet, the transmission facilities required to serve the newly designated renewable energy zones would result in either trapped generation or in additional costs to Nevada's ratepayers.

The Companies have already requested approval of items 1 through 3 (above) in the Nevada Power 2009 IRP (Docket Nos. 10-02009). The Companies are not requesting approval of any other potential transmission facilities to serve the designated renewable energy zones at this time.

By pursuing this three part strategy, the Companies are initiating the planning process approved by the Nevada Legislature (A.B. 387) in advance of the Commission's final actions regarding regulations for the renewable energy resource zones or identifying collector systems. Given that permitting and construction of legs two and three of the strategy could take five or more years to complete, it is critical to initiate these processes as soon as possible so that the facilities are in service when needed.

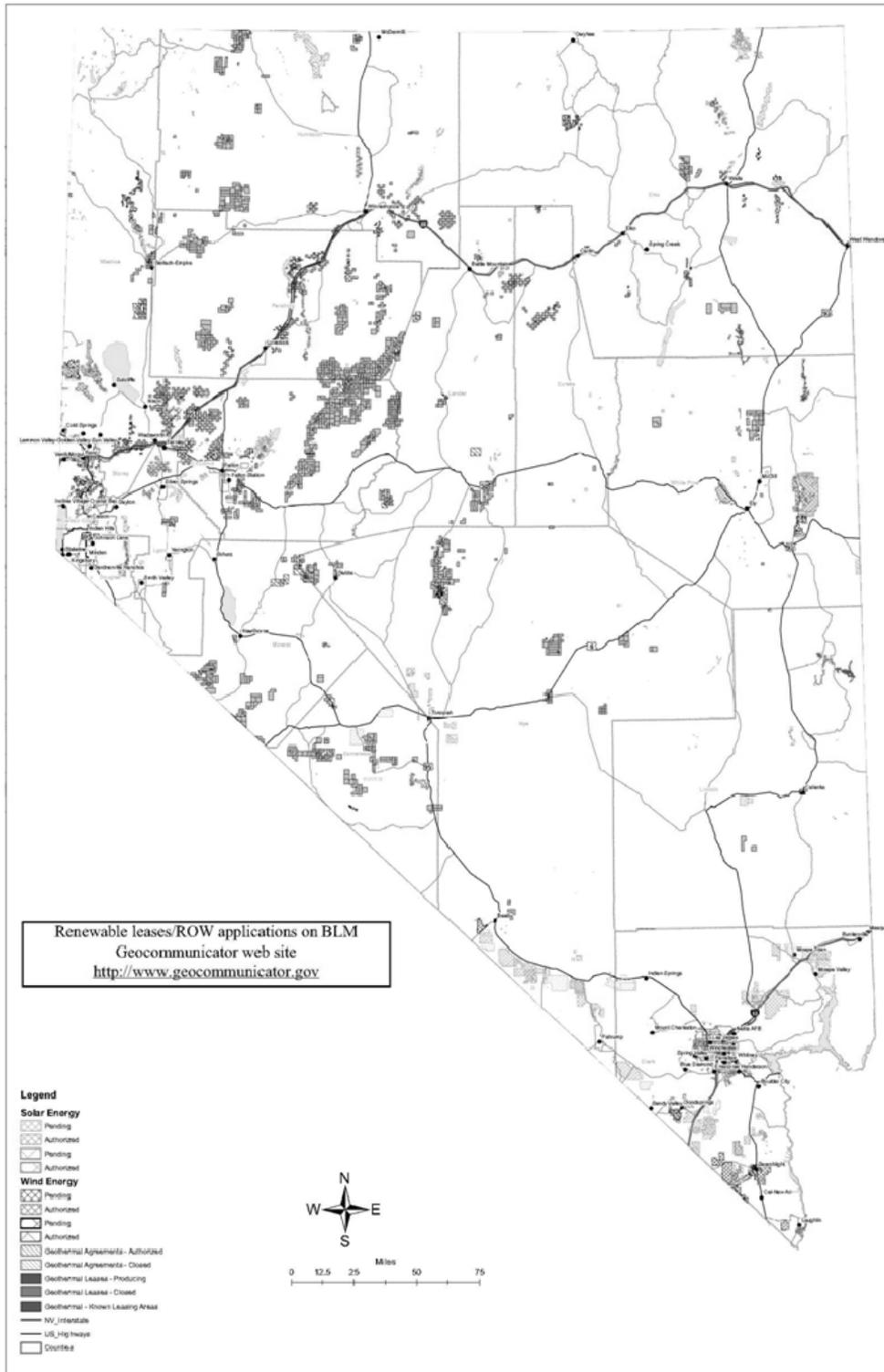
Additionally, as part of the Companies' RECTP, the Companies note that the addition of new 500/230 kV capacity will be important in enabling capacity from generating resources in Nevada to move past existing transmission constraints in Las Vegas if the renewable resources do not off-set existing 500 kV thermal resources. Therefore, while not included herein, additional lower voltage facilities around the Las Vegas Valley may be required to accommodate such distribution of resources.

As summarized above, in order to serve the designated renewable energy zones, and taking into consideration the Companies' RPS needs and the needs of potential partners, the Companies may consider expanding 500 kV transmission facilities along the western part of the State. Additionally, new transmission collector lines may be developed to connect areas with multiple generation projects to the transmission system. For example, the Companies may consider the following after obtaining approval for the elements of their initial three part strategy above:

- A. Future Internal West Tie from Amargosa to Blackhawk 500 kV Transmission Line. The Companies may consider a future internal West Tie from Amargosa to Blackhawk, but such consideration is dependent on whether the transmission corridors (as described above) are approved for lines to be constructed in the Las Vegas area. The primary purpose of an internal West Tie would be to provide a bulk transmission outlet for renewable energy zones in the northern and western parts of the State, thus increasing the amount of capacity capable of being delivered into the Las Vegas area. Such a tie would also provide reliability to the connection between the northern and southern service areas and increase the transmission capacity into the Reno-Carson City loads.
- B. Collector Lines. As renewable projects are proposed and integrated into the Companies' transmission system, collector lines may be needed to enable more efficient interconnection of these resources. Collector lines would be proposed new transmission lines to connect areas with multiple generation projects to existing transmission.

A map showing current BLM lease applications and grants is provided in Figure TRAN-1 2. Figure TRAN-1 3 shows all of the renewable resource interconnection requests received by Sierra and Nevada Power. Figure TRAN-1 4 shows a map of the Commission designated renewable energy zones by type of renewable resource.

Figure TRAN-1 2  
BLM Leases



**Figure TRAN-1 3**  
**NV Energy Interconnection Request Queue**

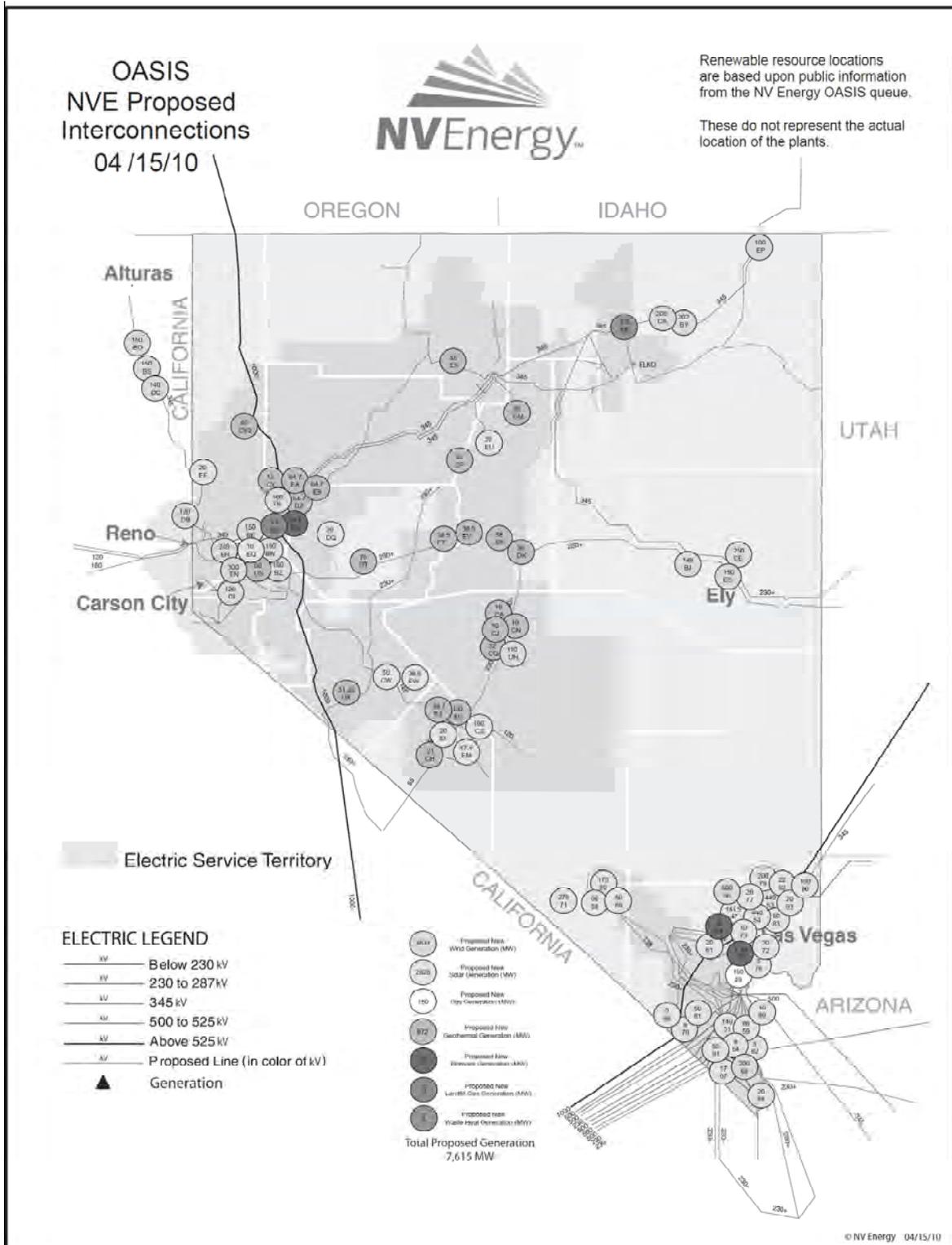
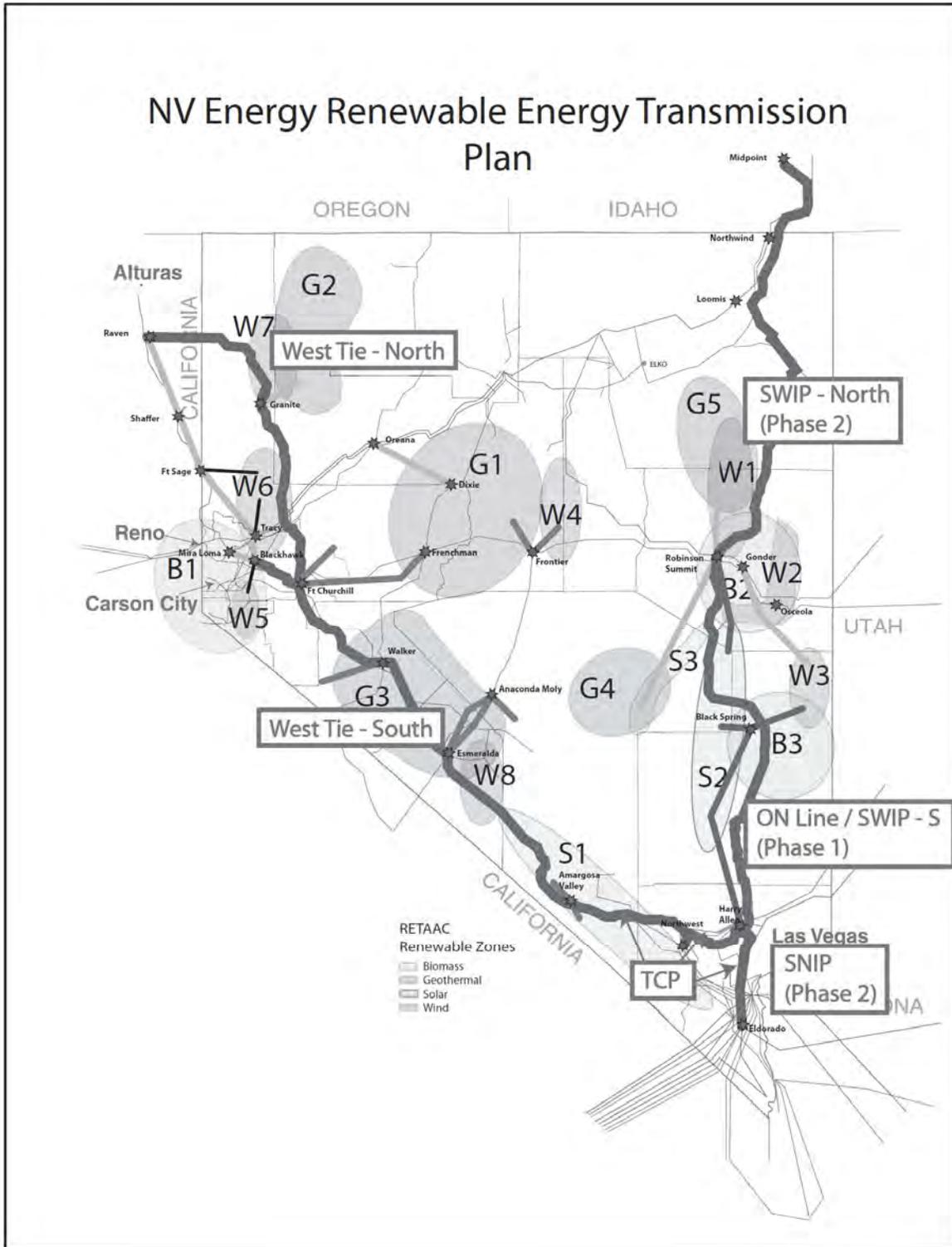


Figure TRAN-1 4  
NV Energy Renewable Energy conceptual transmission plan



### “COLLECTOR” OR “FEEDER” LINES

Based on the generation forecasted by the RETAAC for each of the renewable energy zones in Figure TRAN-1 4, Sierra has developed transmission plans for interconnecting each of the energy zones. In several cases, there is more than one transmission line to a zone. Not all of these lines are required to connect the energy zones. It is very important to remember that any RECTP needs to be sufficiently flexible to accommodate the timing of transmission construction, and the determination of locations within the energy zones for generation projects. The costs estimated here are for the collector lines, not for the bulk or core transmission facilities identified separately. They are generic and provided for informational purposes.

**Figure TRAN-1 5**  
**RENEWABLE ENERGY ZONES**  
**Interconnection Options**

<b>Zone</b>	<b>Resource</b>	<b>RETAAC Generation Capacity (MW)</b>	<b>Potential Interconnection Substation(s) Options</b>	<b>Estimated Line (mi)</b>	<b>Estimated Cost (\$M)</b>
W1	Wind	50-100	Robinson Summit 345 kV	40	47.0
W2	Wind	800-900	Gonder 345 kV, Gonder 230 kV, Osceola 230 kV	20 20 5	25.0 14.0 5.4
W3	Wind	300-400	Gonder 345 kV HA-Black Spring 500 kV	45 125	52.5 229.2
W4	Wind	50-100	Frontier 230 kV	15	11.1
W5	Wind	50-100	Blackhawk 120 kV	15	9.5
W6	Wind	500-700	Tracy 120 kV Ft Sage 345 kV	20 20	12.0 25.0
W7	Wind	50-100	Granite 345 kV, Raven 345 kV, Oreana 345 kV	25 130 40	30.5 146.0 47.0
W8	Wind	50-100	Esmeralda 230 kV	15	11.1
S1	Solar	4,000-5,000	Amargosa 500 kV, Amargosa 230 kV	5 15	13.2 12.8
S2	Solar	5,000-10,000	Robinson Summit 500 kV, HA-Black Spring 500 kV Harry Allen 500 kV	35 120 45	67.2 220.2 85.2
S3	Solar	50-100	Robinson Summit 345 kV	60	69.0
G1	Geothermal	350-400	Oreana 345 kV, Frontier 230 kV, Frenchman 230 kV	35 15 25	41.5 11.1 16.9
G2	Geothermal	100-150	Granite 345 kV, Raven 345 kV, Oreana 345 kV	25 130 40	30.5 146.0 47.0

Zone	Resource	RETAAC Generation Capacity (MW)	Potential Interconnection Substation(s) Options	Estimated Line (mi)	Estimated Cost (\$M)
G3	Geothermal	250-300	Esmeralda 230 kV	15	11.1
			Anaconda Moly 230 kV	15	11.1
			Walker 230 kV	20	14.0
			Walker 120 kV	15	9.5
G4	Geothermal	50-100	Robinson Summit 345 kV	60	69.0
G5	Geothermal	50-100	Robinson Summit 345 kV	40	47.0

The transmission lines that only connect one project are generally considered generator lead lines, which are constructed by generation developers for their own projects. Those lines are not represented here.

### “BULK” OR “CORE” TRANSMISSION LINES

The conceptual transmission plan has a set of core transmission lines and substations that form the backbone of the system. These projects increase Sierra’s export capability, increase export from a sub area, or act as a collector point for more than one project.

As discussed above, the first part of the backbone system is ON Line, and the second is the 500 kV additions in the Las Vegas area as proposed in the Nevada Power IRP filing. After these, the Westside Tie 500 kV line from Amargosa to Blackhawk. The north part of the Westside Tie Line has been proposed as an alternative to Western (no participation by the Companies is contemplated at this time), and such a plan would depend on Western’s interest and the construction of additional transmission in California. The costs estimated here are all generic and are provided for informational purposes only.

**Figure TRAN-1 6**  
Core transmission Projects

From	To	kV	Year	Circuit Miles	Estimated Line Cost (\$ millions)
Robinson	Harry Allen	500	2012	235	509.6 <sup>(1)</sup>
Harry Allen	Eldorado	500	2015+	41	134.4
Harry Allen	Northwest	500	2015+	30	65.4
Northwest	Amargosa	500	2015+	75	146.4
Amargosa	Esmeralda	500	2018+	105	200.4
Esmeralda	Walker	500	2018+	79	153.6
Walker	Blackhawk	500	2018+	86	166.2

(1) Project cost estimates

### “SYSTEM IMPROVEMENTS”

The additional transmission lines in the conceptual transmission plan are system reinforcement lines. The 345 kV lines east and north of Reno allow for the transfer of renewable energy without

interfering with load service. Several 230 kV lines are included to reinforce the existing 230 kV system, which will have more proposed generation from the energy zones than the current thermal limits of such lines. The costs estimated here are all generic and are provided for informational purposes only.

**Figure TRAN-1 7**  
**System Reinforcement Transmission Projects**

<b>From</b>	<b>To</b>	<b>kV</b>	<b>Year</b>	<b>Circuit Miles</b>	<b>Estimated Cost (\$ millions)</b>
Bordertown	California	120	2014+	11	11.8
East Tracy	Blackhawk	345	2018	17	19.7
Blackhawk	Mira Loma	345	2018	20	23.0
West Tracy	Ft Sage	345	2018+	49	54.9
Ft Churchill	Frenchman	230	2018+	47	28.0
Ft Churchill	Greenwave	230	2018+	47	52.7
Ft Sage	Shaffer	345	2018+	35	40.5
Shaffer	Raven	345	2018+	27	31.7
Esmeralda	Anaconda Moly	230	2018+	40 x 2	24.0 x 2
Black Spring	Harry Allen	500	2019+	118	213.4
Blackhawk	Raven	500	2019+	215	398.4

Several transmission substations may be required to connect the renewable energy to the transmission. The costs estimated here are all generic and are provided for information purposes only.

**Figure TRAN-1 8**  
**Conceptual Plan Substation Projects**

<b>Substation</b>	<b>kV</b>	<b>Capacity (MVA)</b>	<b>Year</b>	<b>Estimated Cost (\$ millions)</b>
Falcon	345line SC	800	2012	23.6
Robinson	500 Sub	525	2012	ON Line
	500/345			
	345/345 PS x 2	600	2013	83.0
Osceola	230 Sub		2012	9.6
Anaconda Moly	230- 3 line terminals		2012, 2018	5.6
Harry Allen	500 SC x 2	3000	2013	22.0
	500 – 3 line terminals			11.7
Northwind	345 Sub		2013	10.4
Loomis	345 Sub		2013	14.9
Gonder	345 line terminal		2013	6.2
Frontier	230-2 line terminals		2014	1.7

<b>Substation</b>	<b>kV</b>	<b>Capacity (MVA)</b>	<b>Year</b>	<b>Estimated Cost (\$ millions)</b>
Eldorado	500 line terminal		2015+	9.0
Northwest	500- 2 line terminals		2015+	7.6
Amargosa	500 Sub 500/230	500(1)	2015+	14.2 15.6
East Tracy	345 line terminal		2018	1.1
Mira Loma	345line terminal		2018	1.1
Blackhawk	500/345 x 3 345/120 x 2	3x 525(1) 2x 280	2018+ 2018	35.8 15.5
Raven	345 Sub		2018	20.0
West Tracy	345line terminal		2018+	2.4
Ft Sage	345- 2 line terminals		2018+	2.3
Esmeralda	500 Sub 500/230	500(1)	2018+	14.2 15.6
Walker	500 Sub 500/230 230/120	500(1) 300(1) 300(1)	2018+	14.2 15.6 3.6
Frenchman	230 Sub		2018+	8.3
Dixie	345/230	300(1)	2018+	10.8
Ft Churchill	230,120 Sub	2x 300(1)	2018+	12.0
Black Spring	500 Sub	500 (1)	2019+	23.5
Granite	500 Sub	200 (1)	2019+	15.1

(1) Size and number of transformers is dependent on generation additions

## II. DETAILED ENERGY ZONE PLANS

### Eastern Nevada Energy Zones

Eastern Nevada contains the following energy zones; wind 1, 2, and 3, solar 2 and 3, geothermal 4 and 5, and biomass 2 and 3. In the RETAAC estimates, the generation resources estimated from these zones range from 1,250 MW to 1,600 MW. As of April 15, 2010, interconnection requests (as shown in Figure TRAN-1 3), show generation project developers' interest of approximately 1,060 MW of new generation. In order to move this amount of generation to load centers in Idaho, Reno, Las Vegas, or California, substantial additions in major transmission facilities will be required. Furthermore, the distances to all of these load centers is roughly 200 to 300 miles, which will require higher voltage like 500 kV to create an effective transmission system to deliver the output of these resources to load centers.

The proposed transmission facilities to accommodate these zones begin with building a 500 kV from Robinson Summit to Harry Allen Substation (the ON-Line Project).<sup>3</sup> This creates the backbone for moving generation south to Las Vegas and California. The Robinson Summit Substation includes an 800 MW interface between the 345 kV and the 500 kV system which will act as a collector system for sourcing the ON Line 500 kV system. However, it must be remembered that the Companies' capacity in Phase 2 of the Joint Project with Great Basin Transmission ("GBT") is limited to 760 MW and any capacity above this amount would require requesting transmission service from GBT or the construction of new facilities. The current 230 kV system in this area is very weak, but some additional generation is anticipated to interconnect, and use the existing 230 kV to 345 kV interface at Gonder and/or the existing 230 kV lines to move the power. Should GBT build Phase 2, the backbone transmission may be expanded north towards Idaho loads with the construction of the 500 kV line from Robinson Summit to Midpoint Substation (the SWIP – North project) in Idaho.

Radial 345 kV lines from Robinson Summit or Gonder also may serve as interconnections for geothermal zones 4 and 5, solar zone 3, and wind zone 1, 2, and 3. However, as stated, the Companies' transmission capacity rights to move such resources are limited under the Joint Project. Some of the wind zone 2 resources could be directly connected to the existing 230 kV system. Large generation projects, at or above 300 MW, however, should be directly connected to the 500 kV system at Robinson to avoid using a majority of phase shifter and transformer capacities for only one project. Radial 500 kV lines may serve the biomass zone 3, solar zone 2, and may also be an option to serve wind zone 3. The potential capacity limitations on ON Line may drive generation south of the ON Line midpoint, to be connected directly to the Harry Allen Substation.

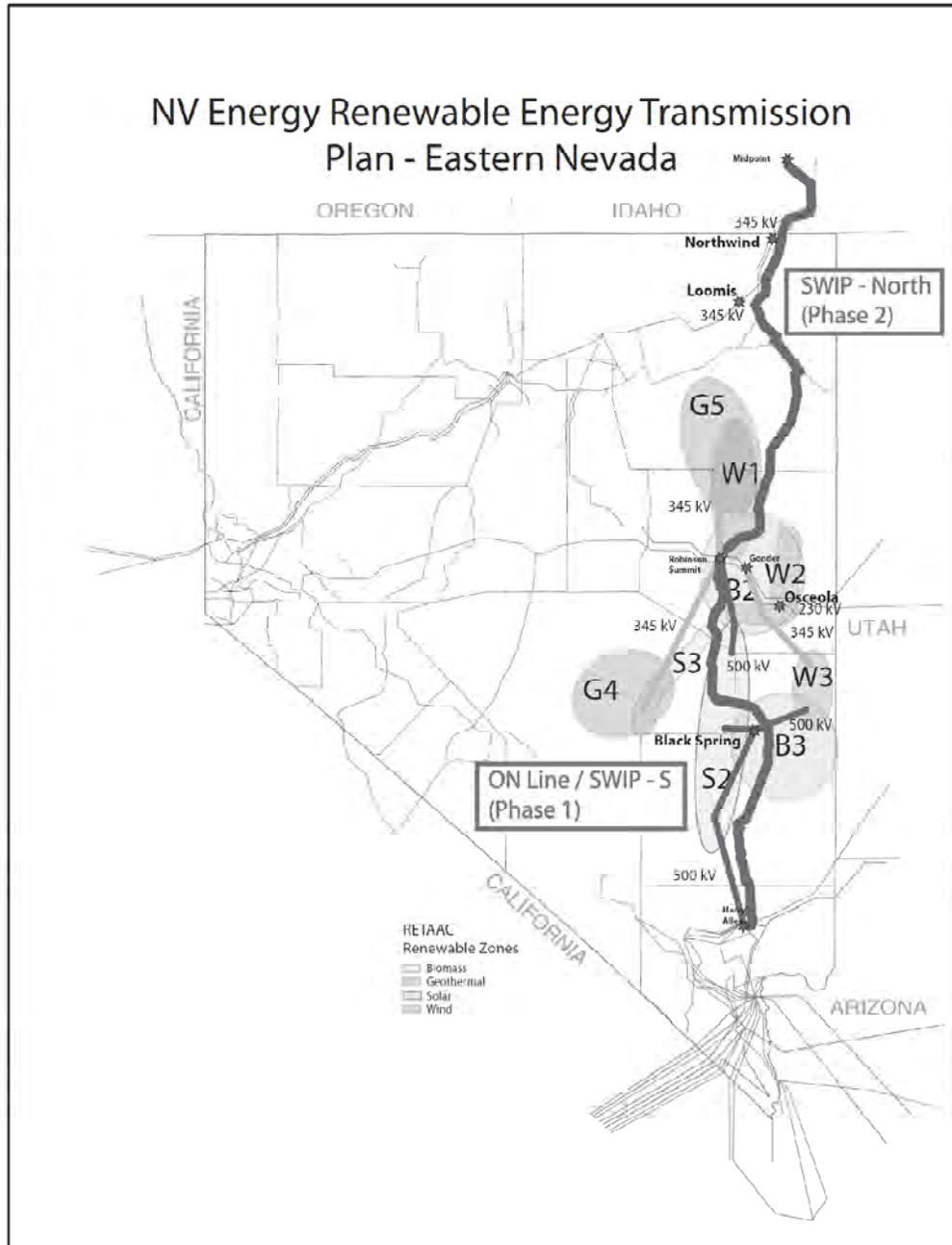
Current interconnection requests also indicate that there are generation projects outside the RETAAC energy zones. Two 345 kV substations (Northwind and Loomis) are being evaluated along the existing Humboldt to Midpoint 345 kV line for generation interconnections. One 230 kV substation (Osceola) is also being evaluated in wind zone 2. All of these projects are customer specific with respect to timing and execution of contracts, but combined they may require about \$34,500,000 in transmission system upgrades.

The ON Line Project is required for the plan to serve the Eastern Nevada energy zones.

---

<sup>3</sup> Under the Joint Project proposal with GBT, NV Energy's capacity rights to ON Line are limited. Therefore, parties seeking transmission in excess of NV Energy's rights after completion of Phase 2 may need to request access from GBT.

**Figure TRAN-1 9**  
**Energy Zone Transmission Additions – Eastern Nevada**



## Western Nevada Energy Zones

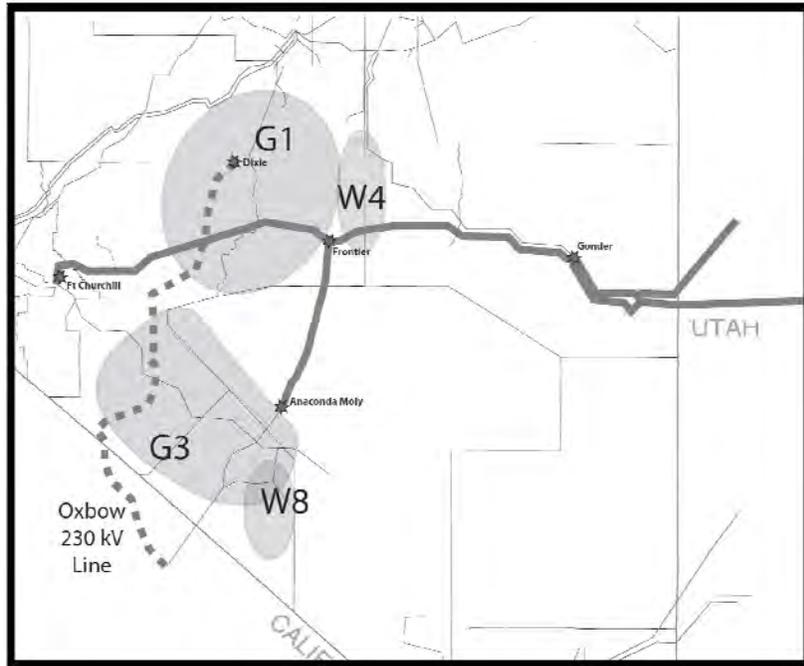
Western Nevada contains the following energy zones; wind 4, 5, 6, 7, and 8, geothermal 1, 2, and 3, and biomass 1. In the RETAAC estimates, the generation resources from these zones are estimated to range from 1,350 MW to 1,850 MW. As of April 15, 2010, interconnection requests per Figure TRAN-1 3, show generation project developers' interest in approximately 1,640 MW of new generation. In order to move this amount of generation to load centers in Reno, Las Vegas, or elsewhere substantial additions in major transmission facilities will be required. Furthermore, the distances to these load centers (except Reno) is roughly 300 to 400 miles, which will require higher voltage lines (like 500 kV) to create an effective transmission system.

The proposed transmission for these zones starts with a 500 kV line from Amargosa Valley to Blackhawk Substation (Westside Tie - South Project). This creates the backbone for moving generation south to Las Vegas and California. The Blackhawk, Esmeralda, and Walker Substations are proposed to include an 800 MW interface to the 345 kV system, and 1,000 MW and 500 MW interfaces to the 230 kV system, which will act as a collector system for the 500 kV system.

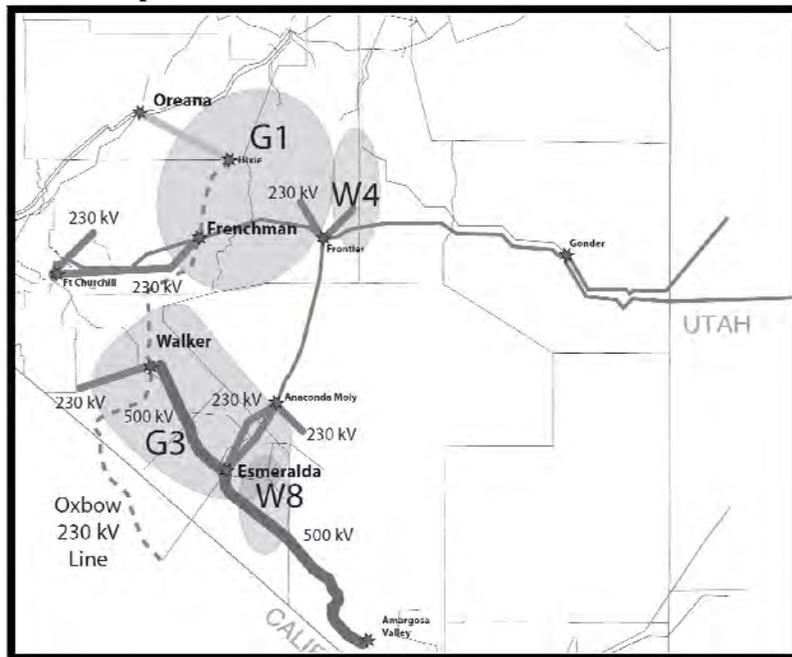
The existing Sierra 230 kV system is very long and weak. See Figure TRAN-1 10 for the existing 230 kV transmission in northern Nevada. The proposed generation interconnections on the 230 kV system total about 800 MW (see Figure TRAN-1 3), but the existing 230 kV transmission has thermal limits of only 350 MW. The conceptual transmission plan is to construct multiple substations to remove the proposed generation to the planned 500 kV line at Esmeralda and Walker substations, and to existing Tracy to Valmy 345 kV line at Oreana substation. Three connections to Sierra, at Dixie, Frenchman's Tap, and Walker substations are planned to create more transmission paths for the proposed generation to be transferred to the 345 kV and 500 kV planned transmission lines, see Figure TRAN-1 11 for the planned transmission additions.

Oreana to Dixie 345 kV line is to deliver generation from geothermal zone 2. Ft Churchill substation improvements are required to increase the transfer capability from 150 MW to 600 MW. Required improvements include 2 – 230/120 kV 300 MVA transformers between the 230 bus and the 120 kV bus to provide a reliable 300 MW connection to the 230 kV system. Walker substation, 1-500/230 kV 500 MVA transformer and 230/120 kV 300 MVA transformer, make 230 kV and 120 kV feeder lines available in the Walker Substation area. The Esmeralda substation, 2-500/230 kV 500 MVA, is the primary collection point from the 230 kV system and renewable energy geothermal zone 3 and wind zone 8. Two 230 kV transmission lines are planned to connect to the existing 230 kV system for redundancy. Additionally, 230 kV feeder lines are anticipated at Frontier, Walker, Esmeralda, and Anaconda Moly substations to connect to proposed generation.

**Figure TRAN-1 10**  
**Existing 230 kV Lines – Northern Nevada**



**Figure TRAN-1 11**  
**Conceptual Plan 230 kV Reinforcements – Northern Nevada**



The existing 345 kV lines from Tracy to Hilltop substation have east to west transfer limit limitations due to the Reno loads and limitations due to the size of the Bordertown phase shifter and the Hilltop 230/345 kV transformer. The conceptual plan is to move the 300 MVA phase

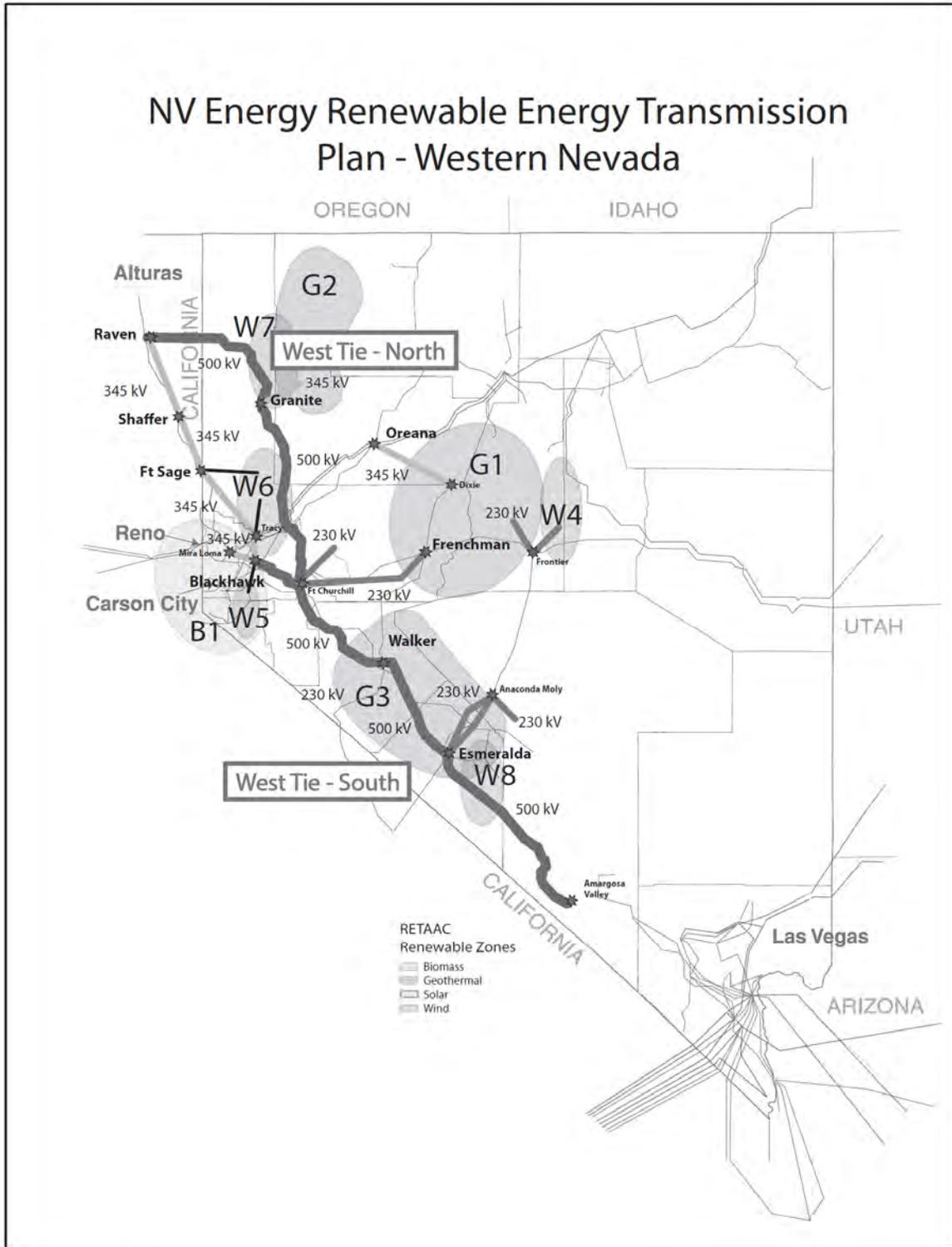
shifter to Hilltop and construct a new 345 kV transmission line from West Tracy to Ft Sage. This provides a second path to Ft. Sage Substation which relieves the east to west Reno load constraint and provides redundant transmission to generation connected at Ft Sage or south of Ft Sage. The move of the phase shifter places both 300 MVA constraints in the path at Hilltop to allow more generation to be connected south of Hilltop substation. The generation in Figure TRAN-1 3 shows approximately 480 MW of interconnection requests to Sierra Pacific Power Company along the 345 kV line north of Tracy. If the generation in this area increases without a new tie to California, two 345 kV lines from the generation to the Blackhawk 500 kV line with larger 500/345 kV transformers at Blackhawk may be required.

The backbone 500 kV transmission (Westside Tie-North) is conceptually planned for expansion from Blackhawk to Raven depending on Western's interest in such a tie to their northern California area (the Companies have not expressed an interest in participating in such project at this time). A 345 kV line from Blackhawk to Tracy and Blackhawk to Mira Loma substations are also required to connect the backbone Westside Tie South 500 kV line at Blackhawk. Several generations projects are also planned around the Reno area, which may use 120 kV or 345 kV lines to connect to the 500 kV system at Blackhawk.

Current interconnection requests indicate that there are generation projects outside the RETAAC energy zones. Two 345 kV substations (Raven and Shafer) are being evaluated along the existing Alturas line for generation interconnections. These projects are customer specific with respect to timing and execution of contracts, but combined they may require about \$36.2 million in transmission system upgrades.

The Westside Tie-South is required for the plan to serve the western Nevada energy zones. The addition of 500 kV transmission lines from Amargosa Valley to Harry Allen and the Harry Allen to Eldorado substation is also required for western Nevada generation to move past transmission constraints in Las Vegas, specifically, the northern cut plane limit and the Centennial Project limit.

**Figure TRAN-1 12**  
**Energy Zone Transmission Additions – Western Nevada**



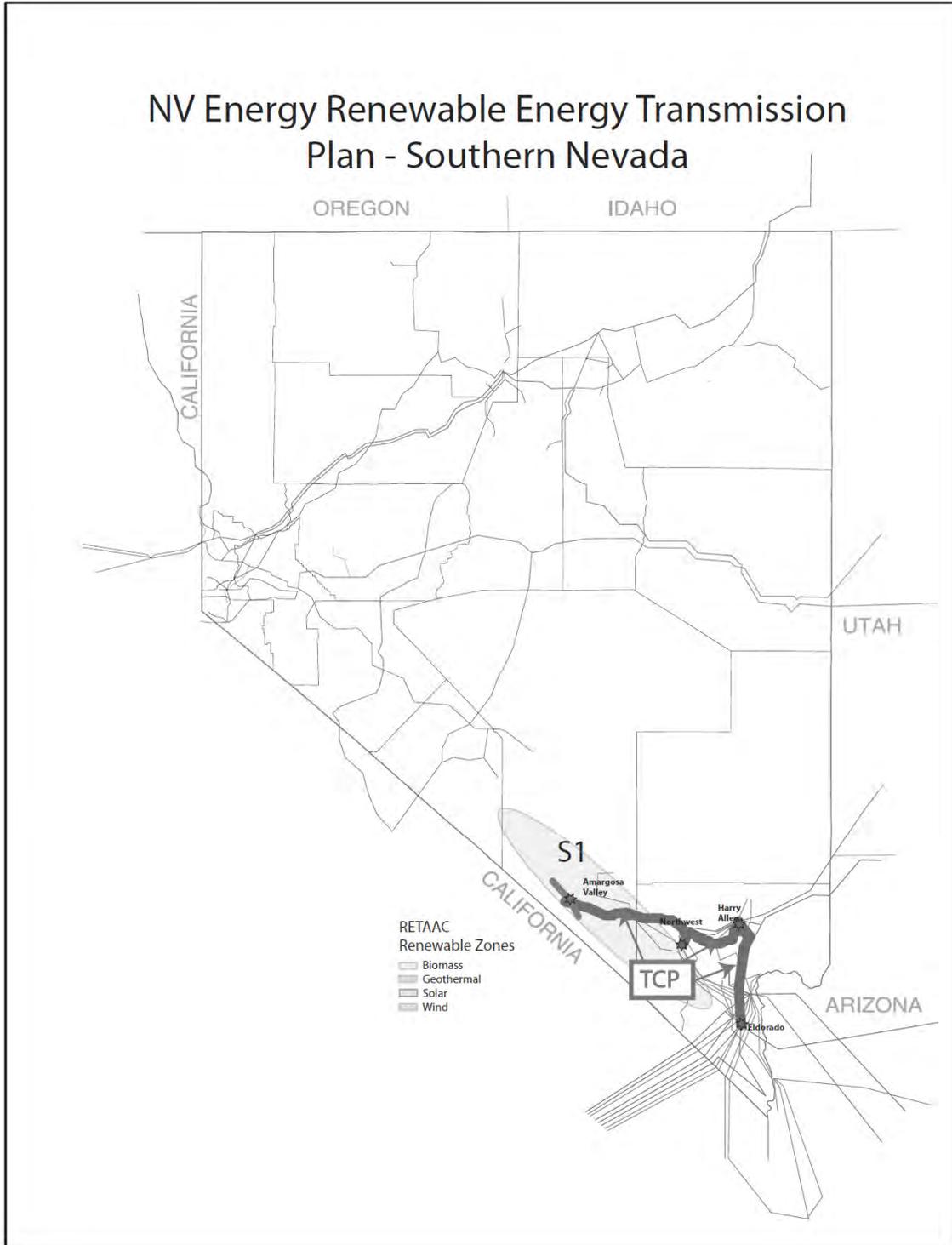
## **Southern Nevada Energy Zones**

Southern Nevada contains the solar 1 energy zone. In the RETAAC estimates, the generation resources from these zones are estimated to range from 4,000 MW to 5,000 MW. As of April 15, 2010, interconnection requests (see Figure TRAN-1 3), show generation project developers' interest in energy zone solar 1 of 550 MW of new generation. In order to move the RETACC's estimated amount of generation to load centers in Las Vegas or California, substantial investment in major transmission facilities will be required. For example, for the amount of solar generation estimated in solar 1 energy zone, approximately three to four new 500 kV lines may be required. The distance to load centers is short compared to other energy zones in Nevada, roughly 70 to 150 miles.

The proposed transmission for this zone includes the 500 kV transmission line from Amargosa Valley to Harry Allen Substation and Harry Allen to Eldorado (TCP Project). This creates the backbone for moving generation east to Las Vegas and south to the Las Vegas load center and to California or Arizona. The design of the Amargosa Valley substation is to allow both 500 kV and 230 kV radial feeder lines to connect generation projects. Additional 500 kV substations may also be required for full build-out of the energy zone as additional 500 kV lines are constructed. This plan only covers the first 500 kV line.

The backbone transmission from western and eastern Nevada are both dependent on the southern Nevada transmission additions to fully connect the energy zones to the Las Vegas and California/Desert Southwest load centers.

**Figure TRAN-1 13**  
**Energy Zone Transmission Additions – Southern Nevada**



### **III. Proposed and Potential Transmission Additions**

#### **a. ON-Line Project 500 kV**

On February 1, 2010 Nevada Power filed its 2010-2029 Integrated Resource Plan (Docket Number 10-02009). On March 18, 2010 Sierra filed the Eighth Amendment to its 2008-2027 Integrated Resource Plan (Docket Number 10-03023). Both of these filings included a request to construct the ON Line transmission project. This section is not a change to the previous filings but is provided as an acknowledgement of the above filings. Nevada Power and Sierra proposed to proceed with construction of the ON Line project, which will interconnect the two utilities for the first time as either a Joint Project with GBT or as a Self Build option. As proposed, the ON Line will consist of a 235-mile 500 kV transmission line and fiber optic communication facilities running from a new 500/345 kV substation at Robinson Summit (near Ely, Nevada) to the existing Harry Allen 500 kV Substation. The ON Line would consist of: (i) an approximately 235-mile 500 kV transmission line, along with fiber optic communication facilities, running from a new 500/345 kV substation at Robinson Summit (near Ely, Nevada) to the existing Harry Allen 500 kV Substation located northeast of Las Vegas, Nevada, (ii) a fold-in of the existing Falcon-Gonder 345 kV transmission line at Robinson Summit Substation, (iii) additions to the existing Harry Allen 500 kV Substation, (iv) expansion of and additions to the existing Falcon 345 kV Substation, and (v) expansion of and additions to Sierra's and Nevada Power's existing communication systems. Under the MOU with Great Basin Transmission ("GBT"), these facilities are designated as Phase 1 of the Joint Project. The routes of the proposed ON Line differ slightly in some geographic areas as between the Joint Project and Self Build Project, but the alignments are very similar. The Companies propose to utilize the ON Line with an initial transfer capability of approximately 600 MW and a projected in-service date of December 31, 2012.

#### **b. Harry Allen to Eldorado 500 kV line(s)**

This project is a new double circuit 500V line from Harry Allen Substation to Eldorado Substation to provide access to load centers for renewable generation from the designated renewable energy zones and allow the sharing of the costs of the needed facilities with potential partners such as Western. It is likely that initially only the first circuit will be constructed and the project scope is based on the first circuit. This project includes two 500 kV line terminals, one at Harry Allen and the other at Eldorado, and 41 miles of 3-1590 conductors per phase. The 500kV line will be constructed for a second 500 kV circuit. The estimated cost for Harry Allen Substation to Eldorado Substation 500 kV line and line terminals is \$134.4 million with about three years for permitting and two for years for design and construction. It is the potential for exports that will allow development of Nevada's abundant resources in the designated energy zones and ultimately reduce the costs of transmission to Nevada's ratepayers.

#### **c. Harry Allen to Northwest 500 kV line**

This project is a new 500V line from Harry Allen Substation to Northwest Substation to provide access to load centers for renewable generation from the designated renewable energy zones and allow the sharing of the costs of the needed facilities with potential partners such as Western.

This project includes two 500 kV line terminals, one at Harry Allen and the other at Northwest, and 30 miles of 3-1590 conductors per phase. The estimated cost for Harry Allen Substation to Northwest Substation 500 kV line and line terminals is \$65.4 million with about three years for permitting and two for years for design and construction.

**d. Northwest to Amargosa 500 kV line**

This project is a new 500V line from Northwest Substation to Amargosa Valley Substation to provide access to load centers for renewable generation from the designated renewable energy zones and allow the sharing of the costs of the needed facilities with potential partners such as Western. This project includes two 500 kV line terminals, one at Northwest and the other at Amargosa and 75 miles of 3-1590 conductors per phase. The estimated cost for Northwest to Amargosa 500 kV line and line terminals is \$146.4 million with about three years for permitting and two years for design and construction.

**e. Amargosa to Esmeralda 500 kV line**

This project is a new 500V line from Amargosa Valley Substation to Esmeralda Substation to provide access to load centers for renewable generation from the designated renewable energy zones and allow the sharing of the costs of the needed facilities with potential partners such as Western. This project includes two 500 kV line terminals, one at Amargosa and the other at Esmeralda, and 105 miles of 3-1590 conductors per phase. The estimated cost for Amargosa Valley Substation to Esmeralda Substation 500 kV line is \$200.4 million with about five years for permitting and two for years for design and construction.

**f. Esmeralda Substation**

This project includes 2-500 MVA 500/230 kV transformers, starting with 2-500 kV line terminals and 2- 230 kV line terminals. The estimated cost for Esmeralda substation is \$29.8 million with about five years for permitting and two for years for design and construction.

**g. Esmeralda to Walker 500 kV Line**

This project is a new 500 kV line from Esmeralda Substation to Walker substation to provide access to load centers for renewable generation from the designated renewable energy zones and allow the sharing of the costs of the needed facilities with potential partners such as Western. This project includes two 500 kV line terminals, one at Esmeralda and the other at Walker and 79 miles of 3-1590 conductors per phase The estimated cost for Esmeralda to Walker 500 kV line is \$153.6 million with about five years for permitting and two for years for design and construction.

**h. Walker Substation**

This project includes 500/230 kV 500MVA, 230/120 kV 300 MVA transformers, starting with 2-500 kV line terminals, 3-230 kV line terminals, and 3-120 kV line terminals. The estimated cost

for Walker substation is \$33.4 million with about five years for permitting and two for years for design and construction.

**i. Walker to Blackhawk 500 kV line**

This project is a new 500 kV line from Walker Substation to Blackhawk substation to provide access to load centers for renewable generation from the designated renewable energy zones and allow the sharing of the costs of the needed facilities with potential partners such as Western. This project includes two 500 kV line terminals, one at Walker and the other at Blackhawk and 86 miles of 3-1590 conductors per phase. The estimated cost for Walker to Blackhawk 500 kV line is \$166.2 million with about five years for permitting and two for years for design and construction.

**j. Blackhawk Substation**

This project is a new 500/345 kV 3-525MVA, 345/120 kV 2-280 MVA substation, starting with 1-500 kV line terminal, 2-345kV line terminals, and 6-120 kV line terminals. The estimated cost for Blackhawk substation is \$46.3 million with about five years for permitting and two for years for design and construction.

**k. Blackhawk to Raven 500 kV line**

This project could consist of a new 500 kV line from Blackhawk Substation to Raven Substation depending on Western's desire to interconnect with its Northern California area (NV Energy is not proposing participating in this project at this time). This project would include two 500 kV line terminals, one at Blackhawk and the other at Raven and 215 miles of 3-1590 conductors per phase. The estimated cost for Blackhawk Substation to Raven Substation 500 kV line and terminals is \$398.4 million with about five years for permitting and two for years for design and construction.