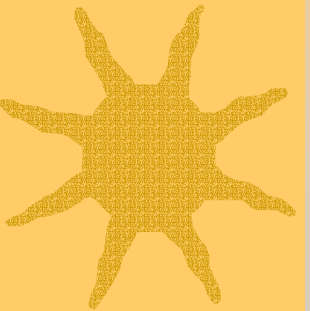
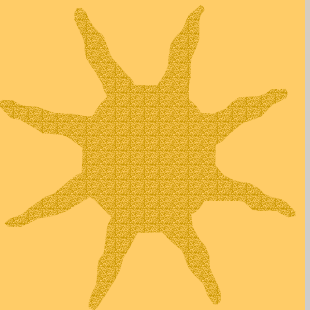


*A Northwestern Consortia to Study  
the Regional Wind Development  
Benefits of Upgrades to Nevada's  
Transmission Systems (T4 Wind)*



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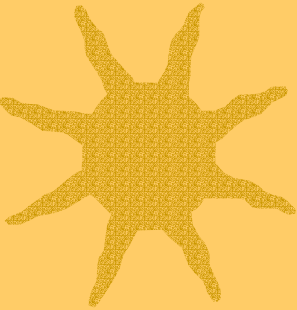
*By: John Candelaria  
Electrical Engineer assisting the  
Nevada State Office of Energy*



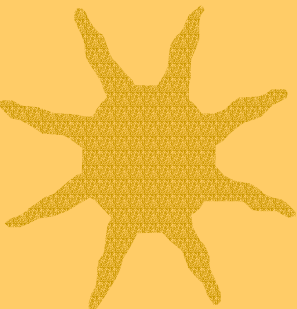


# *Project Information*

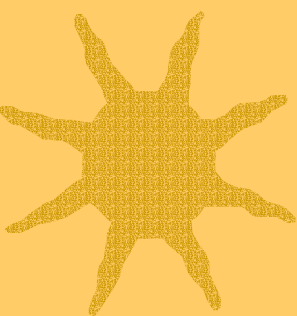
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★ Primary Project Funding: Department of Energy, Sierra Pacific Power Co., Desert Research Institute, Renewable Task Force, Nevada State Office of Energy, Prominent Wind Developers.



★ Project Support: Western Governors Association, DOE, Energy Offices at Oregon, Wyoming and Utah

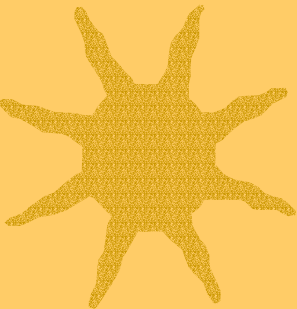
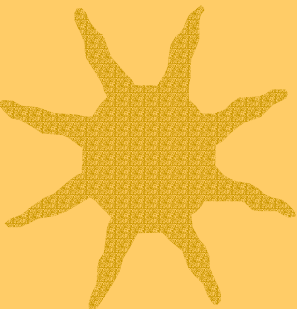
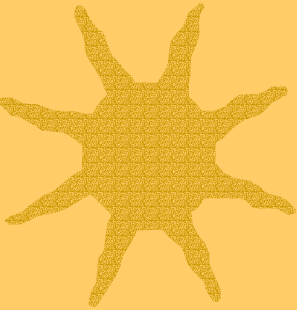


★ Project Expertise: DRI, Idaho Energy Division in Idaho, UNR, Center For Resource Solutions, Transmission Planners from Sierra Pacific Resources, NSOE, Prominent Wind Developers, Nevada Public Utilities Commission



## *Motivation For Project:*

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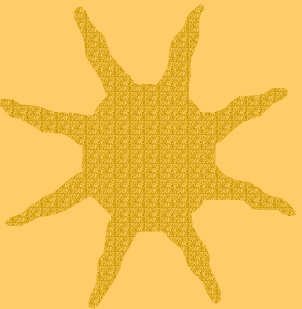
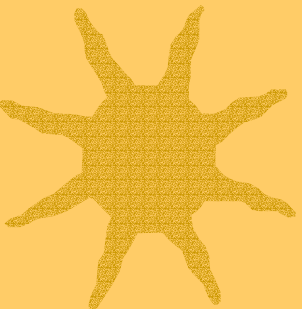
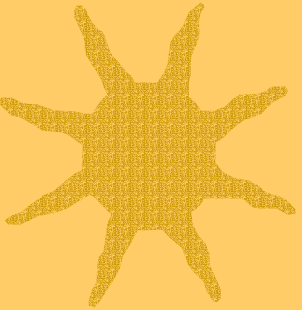
- ★ There are “outstanding” wind resources in Nevada, Idaho, Wyoming and Utah;
- ★ Transmission infrastructure in the west is inadequate to deliver the output of these wind resources;
- ★ This project supports goal of expanding renewable energy production by eliminating barriers to renewable energy development;
- ★ Promotes proactive regional transmission planning in the western interconnection.



## *Motivation For Project Cont.*

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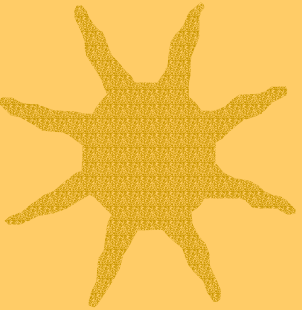
- ★ Provides an integrated transmission assessment so that State and Federal regulatory bodies can see how transmission enhancements in Nevada benefit wind development in Nevada, Idaho, and their neighboring states.



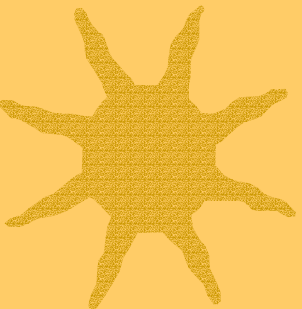
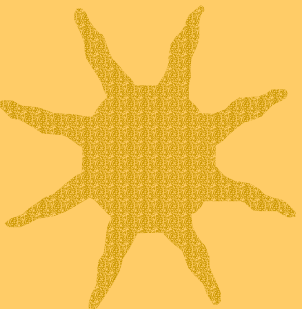


## *Project Tasks:*

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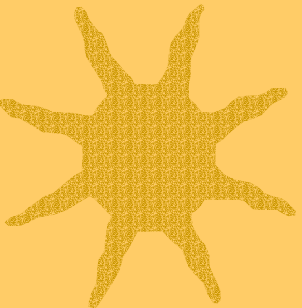
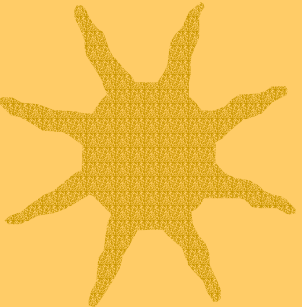
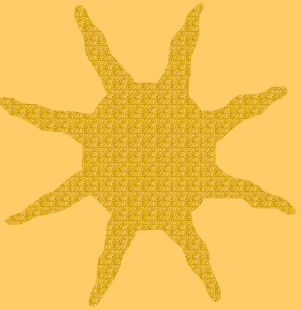
- ★ Task 1: Wind Characterization;
- ★ Task 2 and 3: Transmission Studies;
- ★ Task 4: Outreach Activities;
- ★ Task 5: Develop a White Paper for presentation to FERC, WIEB and PUCN;
- ★ Task 6: Develop Technical Report for presentation to the DOE, and NREL.





# *Task 1: Wind Characterization*

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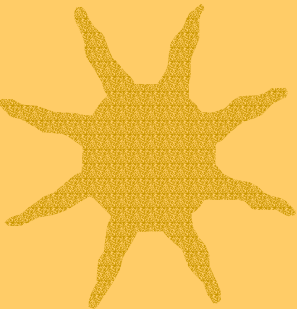
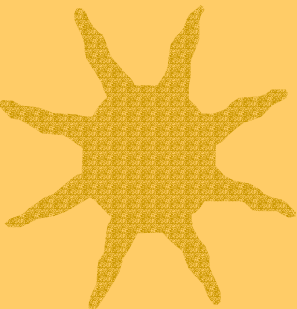
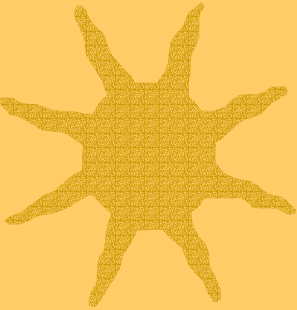


- ★ The Desert Research Institute with support from University of Nevada Reno, NREL, the Nevada Office of Energy, wind working groups in Nevada and wind developers will characterize the wind energy development potential throughout northern and central Nevada;
- ★ Idaho Energy Division will complete wind characterization in southern Idaho.

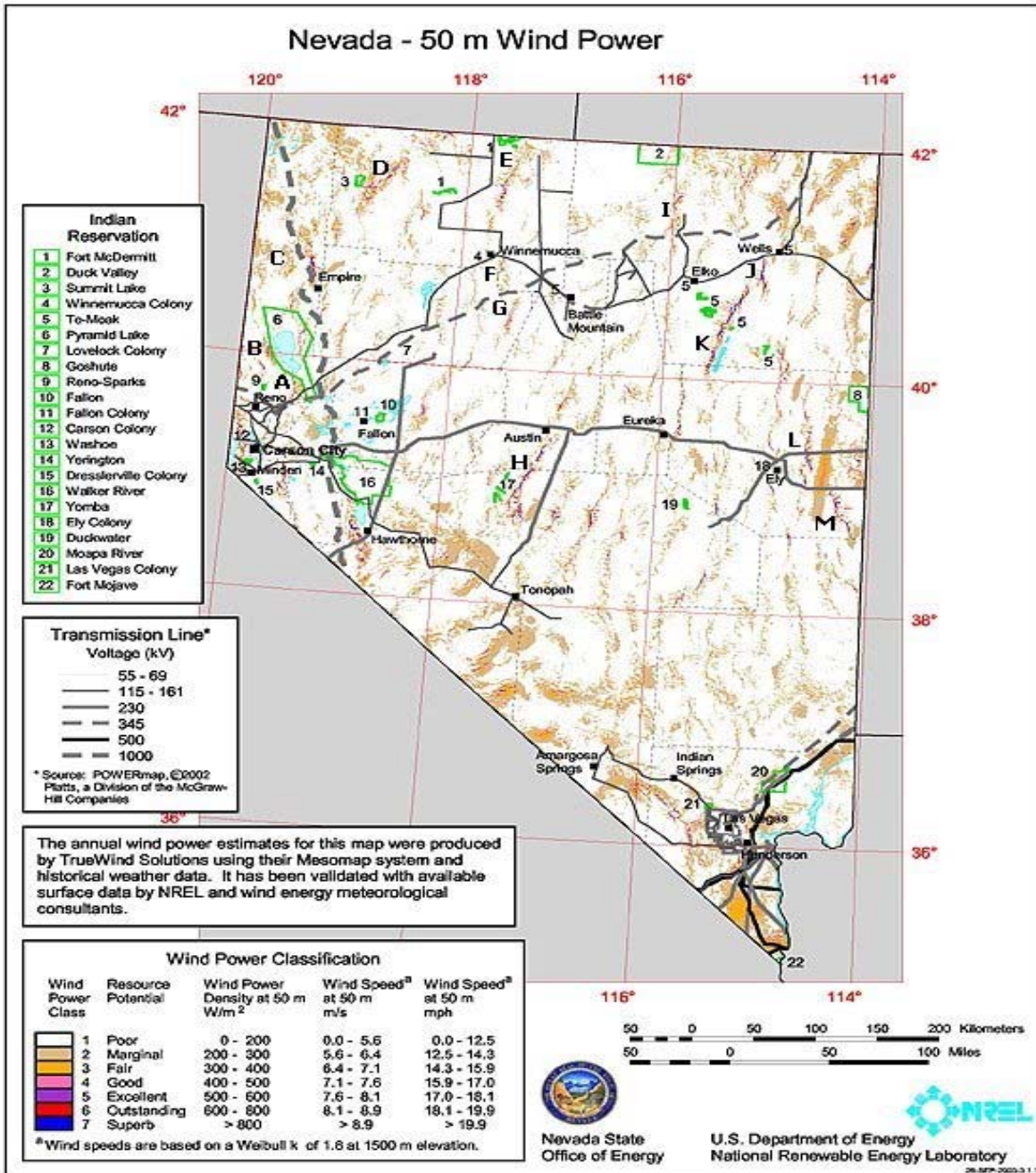
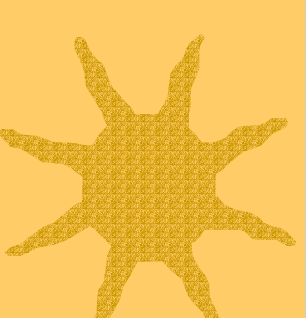
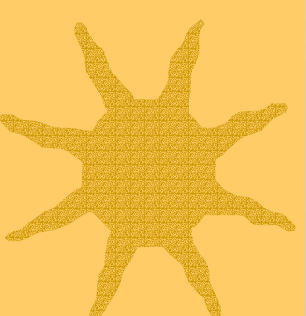
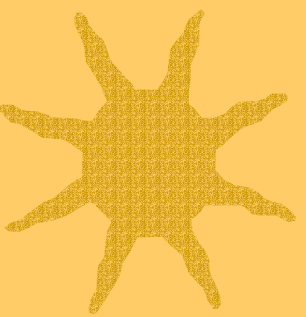


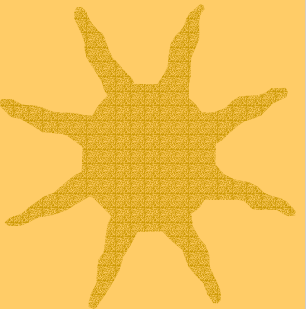
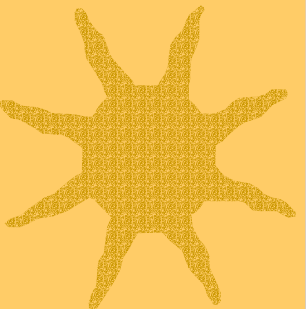
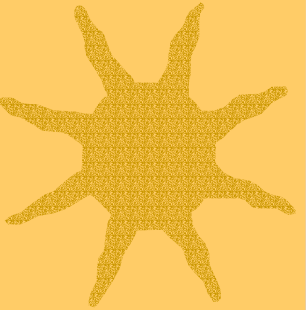
## *Task 1 Cont.:*

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- ★ The wind characterization will build on the “Wind Energy Assessment Study For Nevada” which is in progress and will or has accomplish the following:
  - ✓ Creation of detailed wind resource map;
  - ✓ Develop a database containing detailed wind data collected at 10 sites;
  - ✓ Analysis of meteorological data collected at these sites.





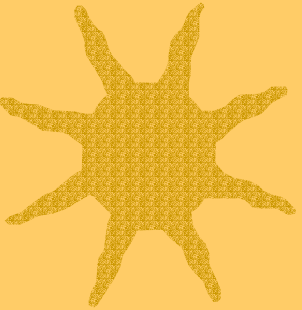
## Wind Power Estimates for Selected Nevada Mountain Ranges for Wind Power Classes 4 and Above

Nevada Wind Development Area	Nevada Map Reference	Class 4 & Above		Permit Likely
		Area	Power	
		sq km	MW	
Pah Rah Range	A	22	111	yes
Virginia Mtns	B	41	204	yes
Granite Range	C	71	353	yes
Pine Forest Range/Black Rock Range	D	100	498	yes
Santa Rosa Range	E	66	330	no
East Range	F	14	70	yes
Tobin Range	G	27	135	yes
Toiyabe Range	H	173	863	no
Independence Mtn	I	25	125	yes
E. Humboldt Range	J	51	254	no
Ruby Mtns	K	164	818	no
Schell Creek Range	L	88	441	no
Snake Range	M	68	342	?
Total wind power potential			4545	9

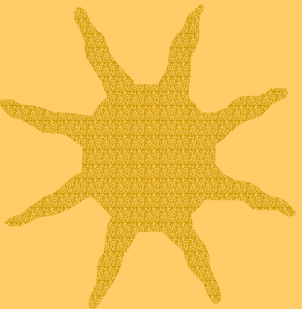


## *Task 2 and 3: Transmission Studies*

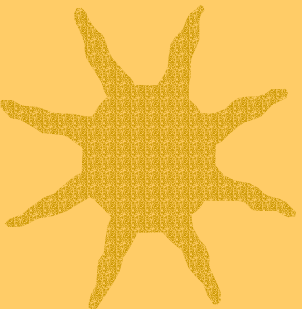
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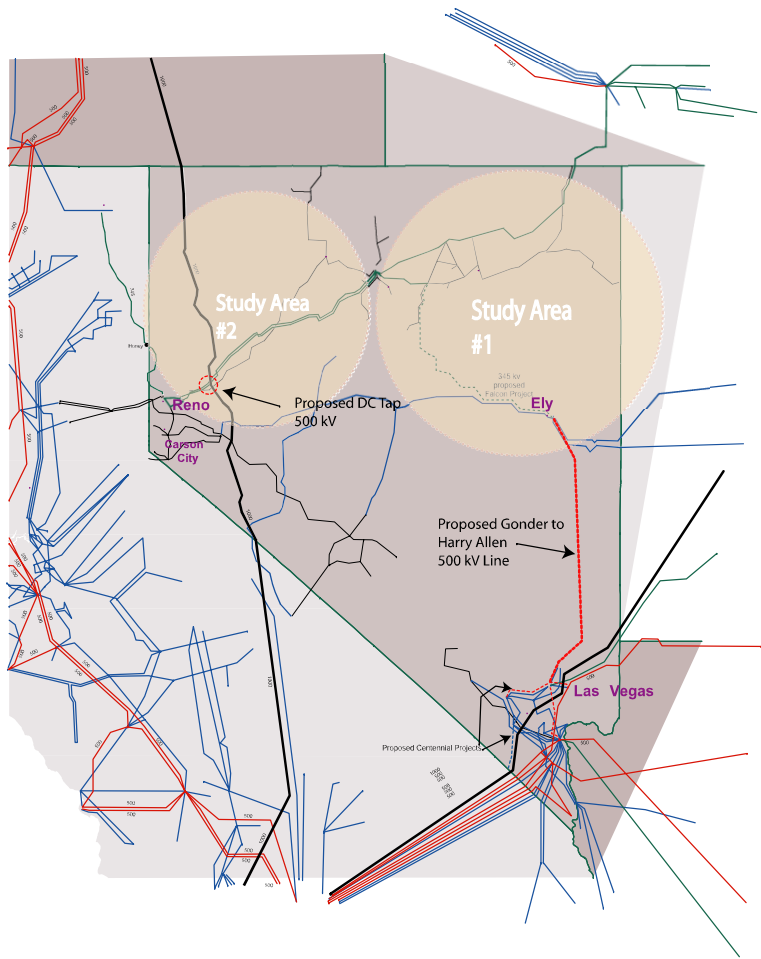
- ★ Investigate the benefits to wind development of six specific transmission upgrades in Nevada and Idaho;



- ★ Study Area 1: Collection system for delivery of wind resources to the Mead trading hub;



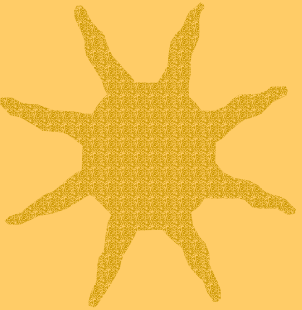
- ★ Study Area 2: Collection system for delivery of wind resources to SP 15 in southern California or the Mid C trading hub by way of the DC Intertie.



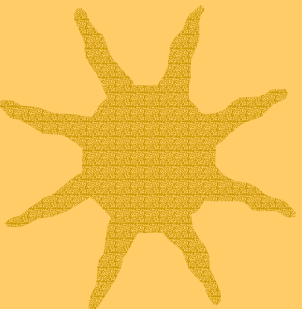


## *Transmission Study Results For Each Upgrade:*

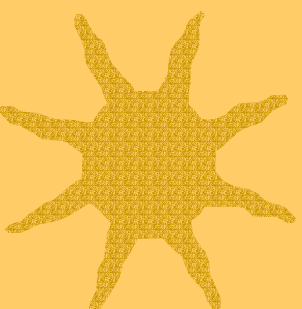
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➤ Cost and capability of connecting wind development area to the grid;



➤ Permitting assumptions;

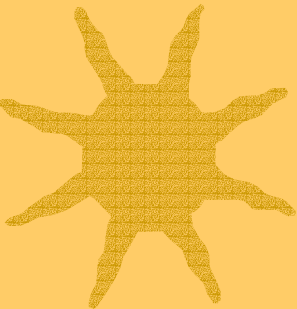
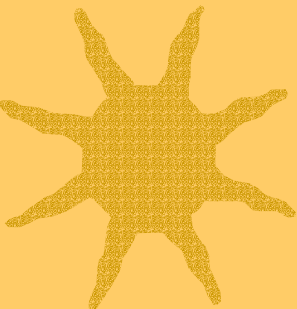
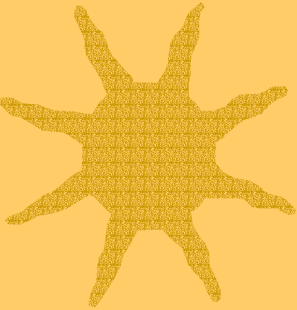


➤ Other transmission planning assumptions.



# *Project Stakeholders*

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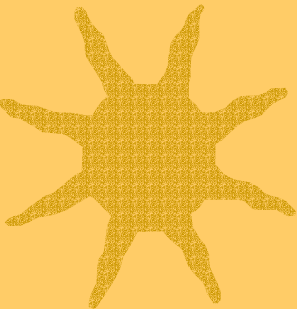
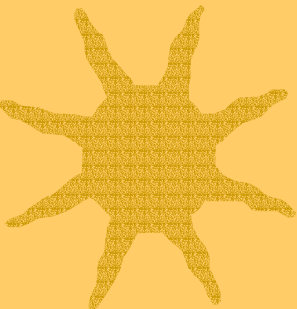
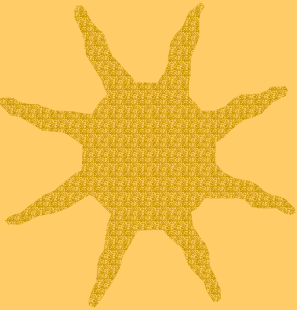


- ★ Western Interstate Energy Board of the Western Governor's Association, Wyoming Energy Office, Utah Energy Office, Oregon Energy Office, Washington State University Energy Program, Nevada Bureau of Consumer Protection, Moapa Band of Paiutes, Nevada and Idaho Wind Working Groups and the Public Utilities Commission of Nevada.



# *Project Schedule:*

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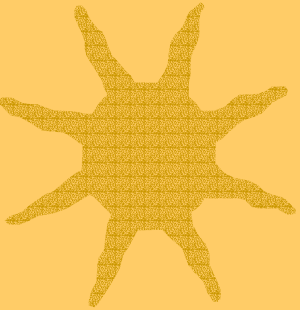


- ★ Project Began on October 1, 2003;
- ★ Wind characterization activities: December 2003 through February 2004;
- ★ Selection of proposed wind development areas: by February 13, 2004;
- ★ Complete transmission studies and write-up for inclusion in SPPC's 2004 Resource Plan: By July 1, 2004; and
- ★ Projected Completion Date is December 2004.



# *Conclusion*

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★ Questions???

