Upper Skagit Indian Tribe

* Feasibility of Wind to Serve Upper Skagit’s Bow Hill Tribal Lands
* Assess Feasibility of Residential Wind Energy Applications
Upper Skagit Indian Tribe is located in the Pacific Northwest, about 1 hour north of Seattle, Washington. Upper Skagit have two reservation land bases:

- Bow Hill the economic land base
- Helmick Road Reservation the center of government, community services & residences

Upper Skagit is a Treaty Tribe with land, riverine and marine rights.
Skagit River & Puget Sound

- Support all 5 species of salmon, steelhead
- The Tribe fishes for all 5 salmon species, shellfish, other fresh & salt water species, hunts and harvests plants

Picture by Kevin Morris
Shrimping

Checking for CWT

Clamming

Coho test fishery
* Strategic Energy Plan
* Energy Efficiency Improvement Plan
* Renewable Energy Resource Assessment
* Integrated site development, building and energy code
* CFL commercial lighting transition
* Energy efficient windows
* Insulation
* Solar demonstration
* Residential rehab, lighting
* Wind Feasibility Presentation

* Describe Objectives
* Describe Progress
* Review Project Schedule
* Lessons Learned
* Objectives

* Determine if resource potential for community scale wind resource exists
* Determine if residential rooftop wind technology has advanced
* Assess economic, environmental, cultural, and social benefits to justify the cost of development
The Tribe is determining the feasibility of community scale wind resource to serve the Bow Hill Tribal Lands. These lands, situated on a ridge above the Skagit valley are within 4 miles of the shoreline, and receive winds both north/south and east/west.
* Installation completed after permitting delay
* SODAR low-wind season deployment completed high-wind season deployment occurring this month
* Monthly data collection reports completed to date
Installation Day
The wind tower is installed at location C. SODAR is referenced at C and spends one month each at locations A and B - once in low wind season then again in the high wind season.
Monthly Field Checks & Data Downloads
• Reference stations, three ASOS weather stations and three Washington State AgWeather Net (AWN) stations suggest an upward adjustment to the USIT met tower data, implying that the mean wind speed of the months on record is lower than the long-term annual average.

• These reference stations require further investigation for data quality, data recovery, sensor history and site exposure.

• This long-term reference site validation and verification will happen in the coming months, prior to completing a full year of data recovery at the site.
Environmental data collection - birds and bats

• Programmed for sunrise, sunset and 3 hours after sunset
• Simulator shows recording time, battery life and memory card capacity
• Acoustical data - free software - you have to analyze the visual graph, or purchase software that can sort it
Small Roof Mounted Wind Turbines Set to Power Rural India: Tata
Tata, one of the largest business groups in India is planning to launch innovative clean energy technologies in rural areas as it plans to grab the opportunity of India’s rapidly expanding power sector.
The Tata Power Company, a subsidiary of the Tata group, plans to test a 2 kW wind turbine which would generate enough electricity to meet the basic demands of a small rural home. With several thousand villages still not connected with the national grid this micro turbine could prove highly beneficial.
The 2 kW turbine which can be mounted on rooftops would be enough to power multiple ceiling fans (rated 60 W) and bulbs/lights (rated 40 W). Even more appliances if battery systems are coupled with the wind turbines.

Clarian Power Wins GE Ecomagination Consumer Innovation Award
Renewable energy system developer chosen over 3,000 entries
SEATTLE - November 16, 2010 - Clarian Power today announced that its SmartBox™ Solar Module is a winner of the Consumer Innovation Award in the GE Ecomagination Challenge, a global contest to find and fund the most innovative clean technologies. Clarian Power is one of several consumer technology companies selected from more than 3,000 entries, and the SmartBox™ Solar Module was selected for its feasibility and potential impact as rated by GE and venture capital leaders.

Residential rooftop applications - have they come into their own?
*Schedule*

* On-time with revised monitoring station installation date
* April 2012 second year data collection begins, analysis of resource
## Task Schedule

<table>
<thead>
<tr>
<th>Task Number Per SOPO</th>
<th>Title or Brief Task Description</th>
<th>Task Completion Date</th>
<th>Original Planned</th>
<th>Revised Planned</th>
<th>Actual</th>
<th>Percent Complete</th>
<th>Progress Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Site Assessment</td>
<td>Year 1 at least 12 months</td>
<td>Start April 1, 2011</td>
<td>50%</td>
<td>Tower installed and collecting data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sodar Deployment</td>
<td>Year 1 up to 5 months</td>
<td>Qtr 1 2011</td>
<td>50%</td>
<td>Sodar unit deployed and collecting information.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Permitting</td>
<td>Qtr 3 2010</td>
<td>Qtr 1 2011</td>
<td>100%</td>
<td>Permits issued March 2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Wind Resource Analysis and Reporting</td>
<td>End of Year 1</td>
<td>Start April 1, 2011</td>
<td>40%</td>
<td>On schedule</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Action Plan</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Residential Wind Technology Assessment</td>
<td>End of Year 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Load Assessment</td>
<td>End of Year 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Transmission &amp; Interconnection Coordination</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Technology &amp; Economic Analysis</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Environmental Assessment</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Preliminary System Design(s)</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Professional Development</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>O&amp;M Plans</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Business Plan</td>
<td>Year 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
* Flexibility re: project schedule - delays
* Project unknown costs - other/miscellaneous to cover unexpected extra staffing efforts, software needs, etc.
* Recognize climate change is affecting data collection and future forecasts
* Looking forward to 2\textsuperscript{nd} year of data collection to improve/inform Final Report

* Load assessment, cost analysis of design options, business plan, environmental and utility efforts