**CO2 emissions considerations for the Keystone pipeline and development of tar sands**

February 18, 2014 Alex Slocum

**Problem observation:**

The Alberta tar sands are being mined over a vast area (<http://en.wikipedia.org/wiki/Oil_sands>) which will destroy large swaths of forests releasing even moe carbon into the atmosphere (<http://www.forestecologynetwork.org/climate_change/sequestration_facts.html>). Just mining the oil and consuming it could have a huge impact on climate change <http://www.scientificamerican.com/article.cfm?id=tar-sands-and-keystone-xl-pipeline-impact-on-global-warming>

**Hypothesis:**

The effect on climate change does not have to be negative IF as part of land reclamation of the mined tar sands area, developers of the tar sands resource were required to plan and invest for when the tar sands are depleted. This scenario could include for every square km of land to be reclaimed, a 5 MW wind turbine is installed.

The figure below shows the cumulative effect over the years of this land reclamation requirement, with 50% of the total tar sands land area being reclaimed with wind turbines. Similar requires are obtained with 10% of the area reclaimed as PV power stations. This requires the tar sands developers to invest a portion of sales, $20/bbl for the scenario here) into renewable energy production; however, they benefit because they can use the electric power for production of the tar sands, and once the number of turbines increases to a point, they can start sending power out on the same lines they initially had installed (are in the process of installing) to develop the tar sands.

**Experiment:**

It is thus proposed:

1. Delay Keystone pipeline decision for 12 months while the experiment is run
2. ASAP begin test project to install 10 wind turbines on reclaimed land and study the project to learn costs and issues with respect to ultimately widespread application of this reclamation strategy.
3. Along the Keystone pipeline right of way in the US, the US Govt. will study installation of power transmission lines to enable farmers to develop their wind resources to the fullest ability, independent of existing obstructionist power generation regulations.

**Analysis:**

The analysis is done in the spreadsheet ***tar\_sands\_CO2\_renewable\_energy.xls*** key cells are shown below.



