

## Memorandum

**To:** Washington State Climate Legislative and Executive Workgroup (CLEW)

**From:** Tim Kidman and Christina Waldron, Leidos

**Subject:** Low Carbon Fuel Standard Clarifications

**Date:** February 3, 2014

On 1/31/2014, Leidos was tasked with preparing a memo to clarify some details of its 2013 analysis of a potential Low Carbon Fuel Standard (LCFS), and report the value on a cost per gallon basis. Leidos has never calculated a cost per gallon value for a Washington LCFS to date. Recent reports in the media misrepresent the cost by erroneously applying a methodology for a carbon tax rather than an LCFS to Leidos' cost effectiveness values. The result over-estimates the per gallon cost by approximately one order of magnitude. This is based on the fact that the LCFS reduces only 10% of the carbon in the fuel, not 100%.

Per Washington's request, Leidos calculated the net present value cost per gallon of fuel (gasoline and diesel) for an LCFS to be between **\$0.06** and **\$0.08** per gallon from 2016 through 2035. This value corresponds to the net present value cost of reductions of **\$103** and **\$131**, respectively, as included in the Leidos reports to the Climate Legislative and Executive Workgroup (CLEW). The cost per gallon was calculated based on the following general equation:

$$\text{(NPV change in fuel expenditures from 2016 to 2035)} / \text{(Total gallons consumed from 2016 to 2035)}$$

In addition, Leidos was tasked with running an additional model scenario to address concerns over differences between Leidos findings and those contained in a previous Washington State-sponsored study by TIAX. A main driver of the difference in results is a varied assumption regarding how low carbon ethanol would enter the market. The TIAX study essentially assumed that the low carbon ethanol would first displace high-carbon ethanol (primarily mid-west corn) before eroding gasoline consumption. Conversely, Leidos assumed that low-carbon ethanol would immediately displace gasoline consumption. The result of this varied assumption is that although both studies reflect a roughly consistent quantity of *new* ethanol entering the market, the TIAX study showed a much smaller change in the *net* change in total ethanol and gasoline. Demonstrating the importance of underlying model assumptions, Washington requested that Leidos conduct a model run in which low-carbon ethanol first displaces existing and forecast high-carbon ethanol. The results of this analysis show that the net present value cost effectiveness from 2016 to 2035 would be between **\$74** and **\$98** per metric tonne CO<sub>2e</sub>, at a cost of approximately **\$0.04** to **\$0.06** per gallon of fuel.

Summary results are provided below. Note: \* All values represent 2013 NPV, 5% discount rate

	Cost effectiveness (\$/mtCO <sub>2e</sub> )	Impact on Fuel Cost (\$/gallon)
Leidos base case	\$103 - \$131	\$0.06 - \$0.08
Leidos modified case corresponding to TIAX assumption	\$74 - \$98	\$0.04 - \$0.06