Before the U.S. Senate Environment and Public Works Committee

"Green Jobs from Action on Global Warming"

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Thank you Chairwoman Boxer, Ranking Member Inhofe, and members of the Committee for the opportunity to testify today. My name is Patrick Zimmerman. I am the Chief Technology Officer at C-Lock Technology.

A well-designed Federal greenhouse gas cap and trade system will link economic incentives and environmental benefits in ways that will stimulate the economy and create thousands of new jobs across all economic sectors. Our new business, C-Lock Technology, provides an excellent example.

C-Lock Technology is a wholly-owned subsidiary of Evergreen Energy—a company with patented technology to refine low-rank coals to improve heating efficiency and significantly reduce pollutants. The pollutant reductions include the removal of compounds that affect air quality including sulfur dioxide, oxides of nitrogen and mercury, as well as decrease the emissions of carbon dioxide.

C-Lock Technology utilizes a patented process to quantify, certify and aggregate greenhouse gas emission reductions, avoidances and offsets so that they have maximum value to sellers and buyers. The process was developed within the Institute of Atmospheric Sciences at the South Dakota School of Mines and Technology (SDSM&T). All patents are therefore the property of the State of South Dakota. As the inventor of this process, I negotiated an exclusive license to develop commercial applications of this technology and recently left my position as Director of the Institute of Atmospheric Sciences at SDSM&T to focus on the C-Lock Technology startup. The new company employs several full-time Ph.D. scientists, technical staff, graduate students and undergraduates. In addition it provides opportunities for SDSM&T professors and their students to collaborate on projects that accelerate the transformation of advanced technical knowledge and cutting-edge science into information and technology that people can use to improve their lives and long-term sustainability.

C-Lock Technology is currently participating in the pre-regulatory phase of the U.S. carbon market and is focusing on the opportunities to impact the international carbon market created as a result of the Kyoto Protocol. Our company is actively participating in the education of undergraduate students, MS students and Ph.D. students who will lead the carbon companies of the future. Our industry will need professionals with skills in business, financial markets and derivatives, ecology and environmental science,

engineering, mathematics and computer science. It is especially important to note that our company will provide opportunities throughout small rural communities for individuals with special communication and technical skills to assist farmers, ranchers and businesses with strategies to reduce their emissions of greenhouse gases and sequester carbon in crops and soils.

We have estimated that for eight agricultural states in the Northern great Plains, greenhouse gas offsets generated by farmers who engage in agricultural practices that store organic matter in soil and trees, and ranchers who implement grazing practices that result in carbon dioxide removal and avoid emissions of methane and nitrous oxide, could increase the regional income by more than one billion dollars per year.[1] In addition, activities that reduce greenhouse gas emissions and remove carbon dioxide from the atmosphere and transform them into long-lived vegetation and organic compounds in the soil also provide important environmental benefits including improved water quality, decreased soil erosion, improved drought tolerance, improved habitat, improved resistance to invasive species, and increased rural tourism and recreational opportunities.

As the policy debate unfolds about the programs to be put in place to reduce greenhouse gas emissions, I encourage you to keep in mind the following characteristics to ensure a robust and fair system:

- First, every economic sector in every state should have the ability to participate.
- Second, every carbon credit must be scientifically sound and reduce human-induced climate change. Legislation must demand high standards so that greenhouse gas emission reductions, avoidances and offsets remain credible. High standards require accurate quantification, independent third-party verification and sound science.
- Third, solutions that can be implemented now must be emphasized—we need to buy time as we develop and implement long-term technological solutions. Immediate removal of greenhouse gases is a higher-priority than permanence because we might reach the climate tipping-point before we can implement long-term technology.
- Forth, solutions should divide the liability amongst many stakeholders to create more accountability and stability than those that concentrate it in a specific sector.
- Fifth, research investments should not favor specific technologies but rather should be designed to spark innovation. We cannot afford to pre-select the winners now.
- Sixth, to stimulate the fastest development of long-term solutions carbon credits must be valuable. It is a higher priority to maintain a carbon credit price floor than a safety valve.
- Finally, an effective Federal greenhouse gas policy will maximize the U.S. global advantage to provide greenhouse gas offsets now through agriculture and clean coal technology

[1] Assuming half of the farmers and ranchers participate and prices of at least $5/T of carbon dioxide equivalent for the next twenty to thirty years.

Specific Federal issues must be addressed for the greenhouse gas market to move from its current pre-regulated phase where markets are inefficient, standards are poorly defined, prices are low and there is a high perceived risk, into the active market phase where resources flow efficiently from the those with potential liabilities to those who can remediate those liabilities in a way that immediately stimulates the production of avoidances, offsets and sinks. Agencies must define the ownership of carbon credits created on federal lands so that if a rancher implements a re-forestation project on Federally-leased land, the ownership of the carbon credits that accrue must be clear for the carbon credits to be marketable.

There should also be provisions that reduce market uncertainties as a result of policy uncertainties. Those who take early action to mitigate their greenhouse gas footprint should be rewarded. Rewards should be in the form of the provision of market certainty. Early action will provide valuable experience to inform wise decision-making. In addition, provisions to indemnify and reward early action will stimulate greenhouse gas-related job creation.

Base-lines from which carbon credits are quantified must be anchored to documented improvements from the average business as usual practice. Any other system penalizes those who have taken early actions to minimize their greenhouse gas impacts. Agricultural offsets belong in the market-system, not the Department of Agriculture subsidy system.

Federal and international greenhouse gas policies need to converge in order to maximize the liquidity and income potential of greenhouse gas markets. This will increase incentives to generate greenhouse gas reductions, avoidances and offsets, and keep market prices high to stimulate technological solutions and create well-paying jobs.

The U.S. has a huge advantage over many industrialized nations. More than 60% of the U.S. land area is under agricultural management. The global average is just 7%. It is therefore imperative that we take full advantage of our abundant agricultural resources to stimulate immediate greenhouse gas reductions and offsets while future technology becomes viable. This will not only preserve and enhance farm jobs, income, and traditions, buy will also stimulate the creation of new economic opportunities in rural communities.