Commercialization of AgriSolar Shelter as a Non-Profit Social Enterprise in Calgary

by: Tari Tebepah

Academic Supervisors: Dr. Chad Saunders & Dr. David Wood

Industry Partner: Steve O’Gorman (STAR Energy)

Question: Whether the AgriSolar Shelter is commercially feasible on a non-profit social enterprise basis in Calgary, Canada?

Background and Rationale

• Integration of solar energy generation with food production
• Potential to contribute to tackling climate change issues
• Non-profit social enterprise model:
  – Target - schools & communities
  – Access to green electricity, fresh produce, sustainable food production alternatives, and clean water.
• Pilot project:
  – Simon’s Farm
  – Campus Community Garden
• STAR Energy’s goal:
  – Establish a non-profit entity in AB for local deployment to schools & communities on non-profit basis
  – subsequently deploy globally to countries - inadequate electricity, food security, & climate resistance.

Introduction

• Integration of solar energy generation with food production
• Potential to contribute to tackling climate change issues
• Non-profit social enterprise model:
  – Target - schools & communities
  – Access to green electricity, sustainable food and clean water production
• Pilot project:
  o Simon’s Farm
  o Campus Community Garden
• STAR Energy’s goal:
  o establish a non-profit entity in AB for local deployment to schools & communities on non-profit basis
  o subsequently deploy globally to countries – with inadequate electricity, food security, & climate resistance.

Community AgriSolar Hub

Methodology

• Literature Review
• Site Selection
• Data Collection
• Pestle Framework

Analysis

Technical
• Technical standards to guarantee efficiency & use
• Structural stability: 10 feet appropriate, though contingent on design & materials
• Sloping or peaked roof: adequate water drainage, stop pooling of water & water seepage
• Foundation & footing: critical - firm & sturdy
• Ventilation & insulation: sheltered - partially or fully enclosed
• Water: rainwater harvesting system integrated

Energy
• Clean energy: operations – no emission of GHG
• Life-cycle emissions: more than 20 times less than coal’s; 10 times less natural gas; offsets within 1-3 years
• Offset credits - 31.39 (5 systems of 48.6kW Community AgriSolar Hub); 1 system of 9.72kW = 6.28 credits

Environmental
• Sheltered space for extended farming seasons
• Reduced stress from weather and pests to plants
• Rainwater harvesting for use; conservation of water

Result

Market Overview
• Alberta’s commitment to diversify economy and increase reliance on renewable energy sources
• Alberta’s target of 30% of electricity from renewable sources - 2030.
• Significant growth trend
• Substantial market opportunity for AgriSolar Shelters

Feasibility of AgriSolar Shelters
• Technology: integrated
• Environmental: climate change issues, availability of clean energy, sustainable farming, access to clean water
• Social: food security, education
• Economics: good returns from green energy sales, carbon credits and rentals; initial capital cost

Conclusion and Recommendation

Conclusions
• Combination of agriculture & energy sectors presents substantial market opportunity
• Potential to achieve sustainable agricultural practices, contribute to renewable energy production & tackle climate change concerns.

Key recommendations
• Obtain necessary technical certifications
• Rework economics on project cost
• Emphasis on grants and donations to cover reasonable project’s capital cost

Limitation and Future Research
• Time Limitation
• Future research on deployment of the AgriSolar Shelter to other countries on a for-profit private enterprise basis.