Feasibility of Efficient Photovoltaics in Eastern Kentucky & Developing a 3-D printed solar vehicle with CFD simulator

Adam Stanley, Matthew Helseltine, Sanghyun Lee
School of Engineering and Information Systems
Morehead State University

Introduction
- The presentation focuses on the potential of solar energy in Eastern Kentucky for sustainable energy solutions.
- Two-axis tracking systems can increase the energy output compared to fixed-surface systems.

Findings
- Developing a 3-D printed solar vehicle will be a practical solution for increased efficiency.
- CFD simulation will be used to optimize the design of the vehicle.

Results
- The results show that solar energy can significantly reduce energy costs in the region.

How to improve
- Algorithm development with MATLAB will help track efficient power generation.
- By reducing the panel area, the system can operate more efficiently.

Algorithm development with MATLAB
- Problem with partial shading
  - Improved performance compared to fixed solar arrays

Future works
- Implementation of developed algorithms in the field
- Actual field tests of designed solar tracking system
- Analysis for future data to compare for percentage increase

Conclusion
- In conclusion, the use of solar energy can provide a sustainable solution for the area.
- By implementing the developed algorithms, the efficiency of the solar system can be improved.

Appendix: Algorithm in MATLAB
- Flowchart diagram showing the algorithm development process.