Economic Impact Research: Review and Discussion

Dr. Jill Fitzsimmons, R.A. Taehyun Kim

Department of Resource Economics,
University of Massachusetts Amherst

Project Advisory Committee
Impacts of Dual-Use Solar on Crop Productivity and the Agricultural Economy in Massachusetts and Beyond
March 13, 2023

Economic Impact Research: Review and Discussion

- Update on Process
- Updates on Research Questions
  - Site Trial Cost Tracking
  - Public Acceptance of Agrivoltaics
  - Impact Estimation
- Upcoming Requests for PAC Input

Economic Research Process

Three main research questions over three Budget Periods (BP)

1. What are the costs associated with producing crops under agrivoltaic installations? (Develop BP1, Implement BP1-3)
2. What is the public's willingness to accept agrivoltaic installations? (Originally BP3 - proposed BP2)
3. What are the factors that contribute to farm adoption of solar installations? How might adoption at different scales impact energy and food production? (Originally BP2 - proposed BP3)

Economic Research Process

Engagement with PAC Economic Working Group and Subgroups

- Econ Working Group met October 2022
  - Scope of UMass/DOE project
  - Details of Cost tracking
  - Overviews of Public Acceptance and Farm Adoption
  - Determined Econ Working group and subgroups will convene as-needed
- Econ Cost Tracking Subgroup met January 2023
  - In-depth review of tools
  - Feedback and advice (next slide)
- Literature Review Draft - Late March/Early April (Thank you!)
- Public Acceptance Subgroup - May 2023

Site Trial Costs Tracking I

- Goal: Develop Crop-Specific Cost Tracking Tool and Track Costs for:
  - 5 sites in UMass/DOE Project
  - Template for Researchers going forward
  - Net Revenue per Acre inputs for NREL tool
  - Identify Bottlenecks and Future Research Questions
- Status: Tools and Templates Developed
  - IRB Approval Obtained
  - Reviewed by Project Team and PAC Subgroup
  - Revisions made based on Project Team and PAC input (Thank you!)
  - 4/5 Projects Engaged in Process

Site Trial Costs Tracking II

- Notes: "More is More" Approach
  - Tools designed for breadth *and* depth, can be modified for other crops
  - Difficult for farmer or lay person to use independently
  - PAC future recommendation - generate App using AirTable, e.g.
- Next Steps:
  - 5 Whole Farm Cost Interviews for 2022
  - Finalize Agricultural Activities data collection practices (with field team)
  - Track Ag Activities costs through 2023 growing year
  - Compile and analyze annually
  - Prepare Tools and IRB protocol for publication

Public Acceptance WTA PAC Assistance

DOE PAC Member input and review

- Input on Design Questions
- Continue to suggest resources that provide a window into the public perception of agrivoltaic installations, including any mention of agrivoltaics in the public realm.
- Published research on public acceptance of changes to public good resources.

Farm Adoption of Agrivoltaic

Research Q in the Proposal: What is impact on Massachusetts, region, US if x% of productive land transitions to agrivoltaics?

- Use results from Site Trials to estimate trade-offs in ag production and farm viability
- Not realistic, given limitations

New Research Q proposal: Identify factors that contribute to farm adoption of renewable energy (update existing literature)

- Farm Adoption of New Technology, Innovation, Ecosystem Services
- Farm Adoption of Renewable Energy
- Farm Adoption of Agrivoltaics

Other new research question ideas? Literature to share?

Thank you!