R011-E: "Biobased Non-Isocyanate Urethane Hybrid Resins for Pultrusion Composites"
Submitted by NDSU
Principal Investigator: Chad Ulven
Request for $273,833; Total Project Costs $547,667

Technical Advisor Comments

- Two reviewers recommended funding may be considered.
- Applicant will provide a 50% match. Match will come from the Soybean Council ($80K cash) and Tecton ($20K cash, $101,938 in-kind).
- Both reviewers felt the objectives were likely achievable. However, both had expressed concerns that preliminary data was not provided.
    - The applicant states, "While the proposed molecular structures are novel, all of the chemistries proposed in each step in the synthesis of the compounds are well known. Some of these synthesis methods are currently being explored in other projects. Thus, the synthesis of the proposed compounds is highly feasible."
- Both reviewers would have liked more information on the methodology.
    - Applicant has provided additional information.
- One reviewer felt the project would not generate immediate renewable energy jobs in ND.
    - Applicants will address this in their presentation.
- Both felt the proposal was lacking in awareness of current research activity and published literature.
    - Applicant has provided a list of references.
- One reviewer felt that the background/qualification section did not provide enough detail, expressing concern about Dr. Ulven's current position and educational history. Council members should note that Dr. Ulven is now the PI.
    - Applicant has supplied CVs for main team members.
- One reviewer felt the project management plan was good, one felt that the 5 large tasks should be broken down more.
    - Applicants will address this in their presentation.
- Both reviewers felt a cost comparison of the bio-based resins versus petroleum based alternatives should be provided.
    - The applicant has proposed to include a 4th objective "*Feasibility Assessment of the Newly Synthesized Resins Demonstrated*. From the perspective of Tecton Products LLC, an acceptable cost-range for the resins produced from renewables for new biocomposite pultrusions in their company would be in the range of 0.8$/lb to 1.2$/lb and we propose to assess whether the resins developed throughout the project can meet this target by the end of the project."
- Both felt the proposal was a new and novel approach. One reviewer stated, "…if successful, could have large payoffs economically, environmentally, and energy-wise…."

Technical Advisor Recommendations

Funding may be considered. Neither reviewer strongly endorsed the proposal. However, both felt that the project did have merit. It is concerning that both reviewers felt more information should have been included in the methodology. This limits our technical experts' ability to assess if the proposal will actually accomplish what it sets out to do.

The project involves a North Dakota business, and focuses on ND biomass, which greatly enhances the proposal.

Suggested Contingencies If Funded

- Both reviewers felt cost comparisons should have been included in the application. The applicant proposes to include this as an objective in the current scope of work. However, if the cost comparisons are unfavorable it might not make sense to move forward with the rest of the project. Therefore, the Council may want to award a portion of funding for the feasibility study with remaining funds contingent upon favorable findings.