



U.S. DEPARTMENT  
of **ENERGY**

Office of Critical Minerals  
and Energy Innovation



# 2025 Annual Merit Review Vehicle Technologies Office

## Results Report

December 2025

## 7. Vehicles Analysis

The Vehicle Technologies Office (VTO) funds research and development (R&D) of engines, batteries, power electronics, motors, materials, and transportation systems. VTO leverages the unique capabilities and world-class expertise of the national laboratory system to innovate new vehicle technologies. VTO is uniquely positioned to accelerate innovative transportation technologies due to strategic public-private research partnerships with industry (e.g., the U.S. DRIVE Partnership, the 21<sup>st</sup> Century Truck Partnership) that leverage relevant expertise. These partnerships prevent duplication of effort, focus U.S. Department of Energy (DOE) research on critical R&D barriers, and accelerate progress.

The VTO Analysis (VAN) subprogram supports the planning and execution of technology, economic, and interdisciplinary analyses to inform and prioritize the VTO research portfolio and provide insights into critical transportation energy problems. VAN supports vehicle data, modeling and simulation, and integrated and applied analysis activities using the unique capabilities, analytical tools, and expertise resident in the DOE national laboratory system. This creates a holistic view of the transportation system, including the opportunities and benefits that advanced vehicle technologies offer by strengthening national security, increasing reliability, and reducing costs for consumers and businesses. Through these tools, the Analysis subprogram delivers greater understanding and insights into quickly evolving vehicle technologies and innovations for a broad range of internal and external stakeholders. Overall, these activities explore energy-specific advancements in vehicles and transportation systems to inform early-stage R&D and offer analytical direction for potential and future research investments.

## Project Feedback

In this merit review activity, each reviewer was asked to respond to a series of questions, involving multiple-choice responses, expository responses where text comments were requested, and numeric score responses (on a scale of 1.0 to 4.0). In the pages that follow, the multiple choice and numeric score questions will be presented in graph form for each project. A table presenting the average numeric score for each question for each project is presented below.

Table 7-1 – Project Feedback

| Presentation ID | Presentation Title                                                                                                    | Principal Investigator (Organization)                  | Page Number | Approach | Technical Accomplishments | Collaboration | Future Research | Weighted Average |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------|----------|---------------------------|---------------|-----------------|------------------|
| <b>VAN033</b>   | Analysis of Employment and Other Economic Impacts of Transportation Electrification                                   | Joann Zhou (Argonne National Laboratory)               | 7-4         | 3.00     | 2.83                      | 3.00          | 3.17            | 2.94             |
| <b>VAN034</b>   | Fleet Research Energy Data and Insights (FleetREDI)                                                                   | Alicia Birky (National Renewable Energy Laboratory)    | 7-5         | 3.75     | 3.63                      | 3.50          | 3.63            | 3.64             |
| <b>VAN050</b>   | Holistic Modeling of Future Transportation Energy Use and Emissions (TEMPO)                                           | Paige Jadun (National Renewable Energy Laboratory)     | 7-6         | 3.25     | 3.75                      | 3.50          | 3.25            | 3.53             |
| <b>VAN051</b>   | Regional Optimization of Application and Infrastructure Architecture in Heavy-Duty Vehicle Electrification (OR-AGENT) | Vivek Sujan (Oak Ridge National Laboratory)            | 7-7         | 3.50     | 3.50                      | 3.67          | 3.17            | 3.48             |
| <b>VAN052</b>   | Enhancing the EVI-X National Framework to Address Emerging Questions on Charging Infrastructure Deployment            | Brennan Borlang (National Renewable Energy Laboratory) | 7-8         | 3.50     | 3.67                      | 3.83          | 3.33            | 3.60             |

| Presentation ID        | Presentation Title                                                                                                                             | Principal Investigator (Organization)                  | Page Number | Approach    | Technical Accomplishments | Collaboration | Future Research | Weighted Average |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------|-------------|---------------------------|---------------|-----------------|------------------|
| <b>VAN053</b>          | Medium- and Heavy-Duty Electric Vehicle Load, Operations, and Deployment (HEVI-LOAD) Augmentation for National-Scale Infrastructure Assessment | Bin Wang (Lawrence Berkeley National Laboratory)       | 7-9         | 3.75        | 3.25                      | 2.00          | 3.50            | 3.25             |
| <b>VAN054</b>          | Managing Increased Electric Vehicle Shares on Bulk Power Systems                                                                               | Brennan Borlang (National Renewable Energy Laboratory) | 7-10        | 3.50        | 3.83                      | 3.17          | 3.33            | 3.60             |
| <b>VAN056</b>          | Agent Based, Bottom Up Medium and Heavy-Duty Electric Vehicle Economics, Operation, Charging, and Adoption                                     | Thomas Bradley (Colorado State University)             | 7-11        | 3.25        | 3.25                      | 3.00          | 3.00            | 3.21             |
| <b>VAN057</b>          | Scalable Truck Charging Demand Simulation for Cost-Optimized Infrastructure Planning                                                           | Ann Xu (Electrotem-po)                                 | 7-12        | 3.50        | 3.83                      | 3.67          | 1.00            | 3.59             |
| <b>Overall Average</b> |                                                                                                                                                |                                                        |             | <b>3.44</b> | <b>3.50</b>               | <b>3.26</b>   | <b>3.04</b>     | <b>3.43</b>      |

**Presentation Number:**

VAN033

**Presentation Title:**

Analysis of Employment and Other Economic Impacts of Transportation Electrification

**Principal Investigator:**

Joann Zhou, Argonne National Laboratory

**Presenter**

Joann Zhou, Argonne National Laboratory

**Reviewer Sample Size**

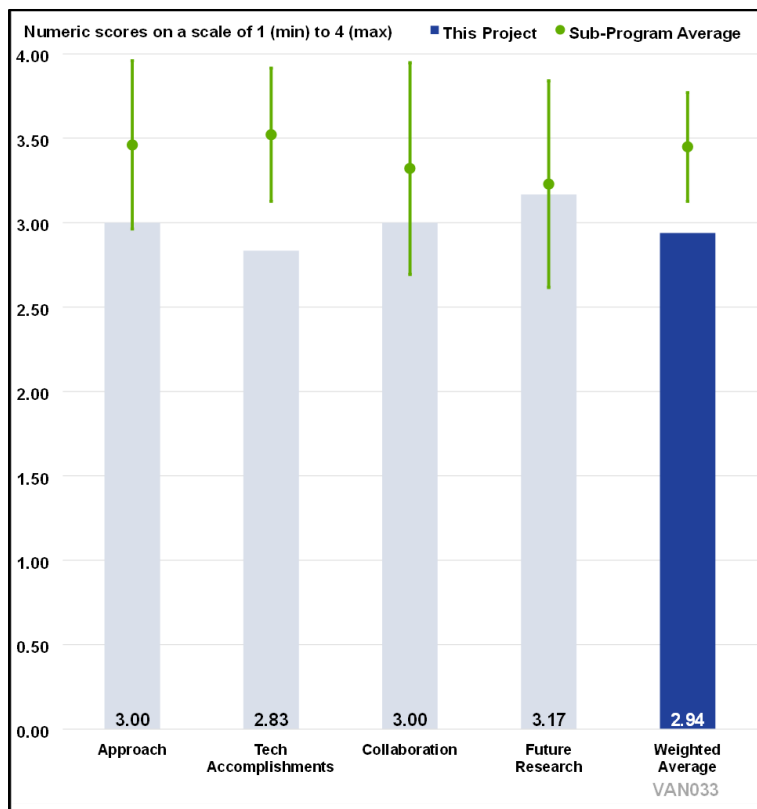
A total of three reviewers evaluated this project.

**Project Relevance and Resources**

67% of reviewers felt that the project was relevant to current DOE objectives, 33% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN033\\_Zhou\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN033_Zhou_2025_o.pdf)



**Figure 7-1 - Presentation Number: VAN033 Presentation Title: Analysis of Employment and Other Economic Impacts of Transportation Electrification Principal Investigator: Joann Zhou, Argonne National Laboratory**

**Presentation Number:**

VAN034

**Presentation Title:**

Fleet Research Energy Data and Insights (FleetREDI)

**Principal Investigator:**

Alicia Birky, National Renewable Energy Laboratory

**Presenter**

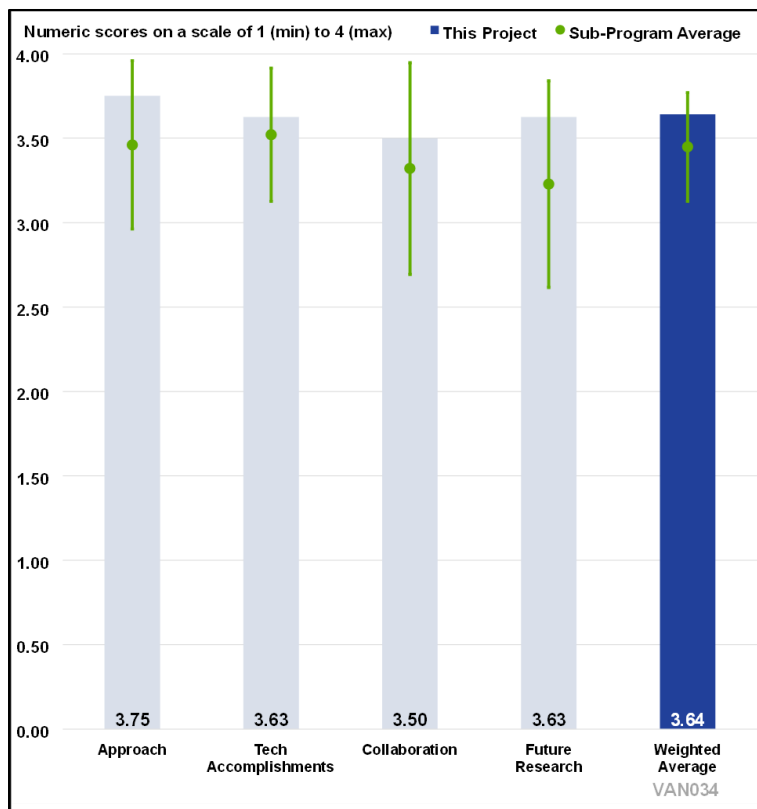
Alicia Birky, National Renewable Energy Laboratory

**Reviewer Sample Size**

A total of four reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.



**Figure 7-2 - Presentation Number: VAN034 Presentation Title: Fleet Research Energy Data and Insights (FleetREDI) Principal Investigator: Alicia Birky, National Renewable Energy Laboratory**

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN034\\_Birky\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN034_Birky_2025_o.pdf)

**Presentation Number:**

VAN050

**Presentation Title:**

Holistic Modeling of Future Transportation Energy Use and Emissions (TEMPO)

**Principal Investigator:**

Paige Jadun, National Renewable Energy Laboratory

**Presenter**

Brennan Borlang on behalf of Paige Jadun, National Renewable Energy Laboratory

**Reviewer Sample Size**

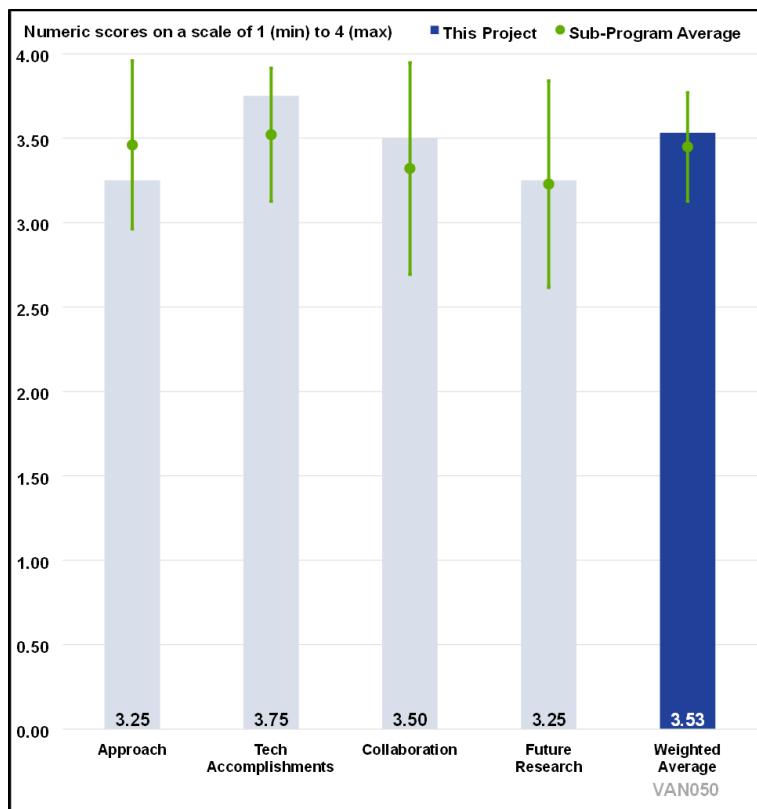
A total of two reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN050\\_Jadun\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN050_Jadun_2025_o.pdf)



**Figure 7-3 - Presentation Number: VAN050 Presentation Title: Holistic Modeling of Future Transportation Energy Use and Emissions (TEMPO) Principal Investigator: Paige Jadun, National Renewable Energy Laboratory**

**Presentation Number:**

VAN051

**Presentation Title:**

Regional Optimization of Application and Infrastructure Architecture in Heavy-Duty Vehicle Electrification (OR-AGENT)

**Principal Investigator:**

Vivek Sujan, Oak Ridge National Laboratory

**Presenter**

Vivek Sujan, Oak Ridge National Laboratory

**Reviewer Sample Size**

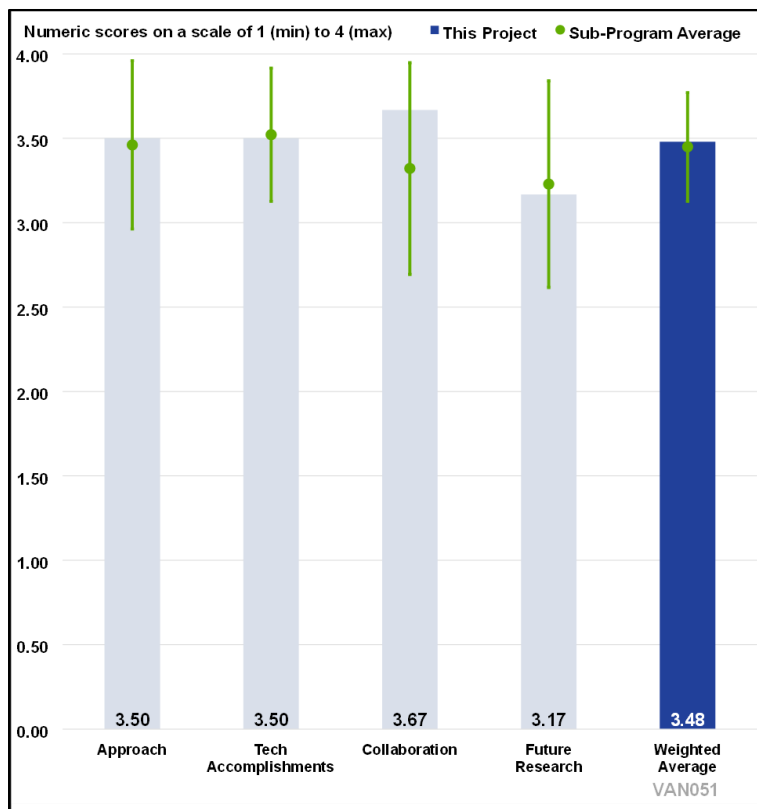
A total of three reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN051\\_Sujan\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN051_Sujan_2025_o.pdf)



**Figure 7-4 - Presentation Number: VAN051 Presentation Title: Regional Optimization of Application and Infrastructure Architecture in Heavy-Duty Vehicle Electrification (OR-AGENT) Principal Investigator: Vivek Sujan, Oak Ridge National Laboratory**

**Presentation Number:**

VAN052

**Presentation Title:**

Enhancing the EVI-X National Framework to Address Emerging Questions on Charging Infrastructure Deployment

**Principal Investigator:**

Brennan Borlang, National Renewable Energy Laboratory

**Presenter**

Brennan Borlang, National Renewable Energy Laboratory

**Reviewer Sample Size**

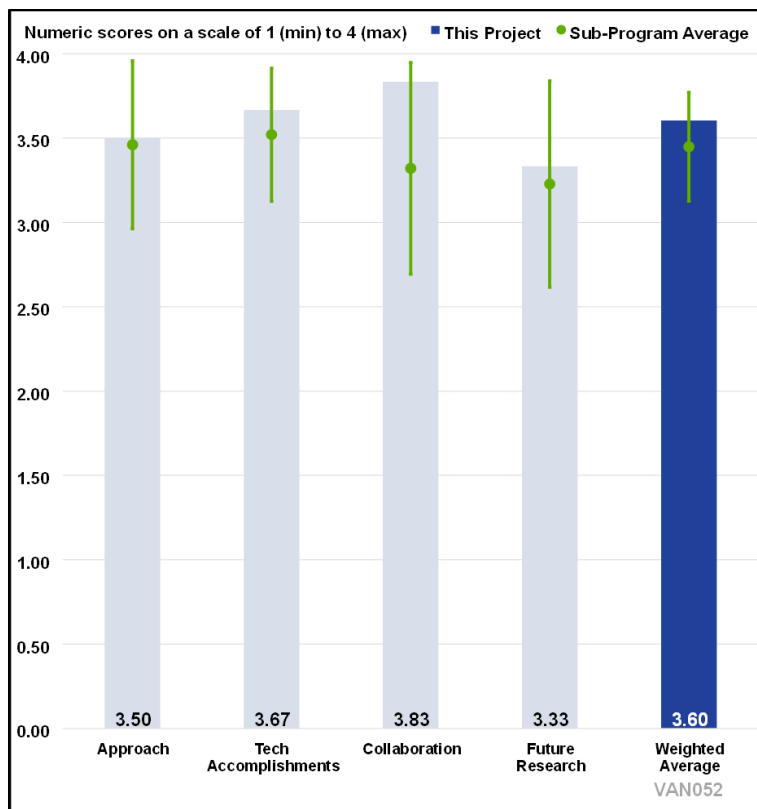
A total of three reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN052\\_Borlaug\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN052_Borlaug_2025_o.pdf)



**Figure 7-5 - Presentation Number: VAN052 Presentation Title: Enhancing the EVI-X National Framework to Address Emerging Questions on Charging Infrastructure Deployment Principal Investigator: Brennan Borlang, National Renewable Energy Laboratory**

**Presentation Number:**

VAN053

**Presentation Title:**

Medium- and Heavy-Duty Electric Vehicle Load, Operations, and Deployment (HEVI-LOAD) Augmentation for National-Scale Infrastructure Assessment

**Principal Investigator:**

Bin Wang, Lawrence Berkeley National Laboratory

**Presenter**

Bin Wang, Lawrence Berkeley National Laboratory

**Reviewer Sample Size**

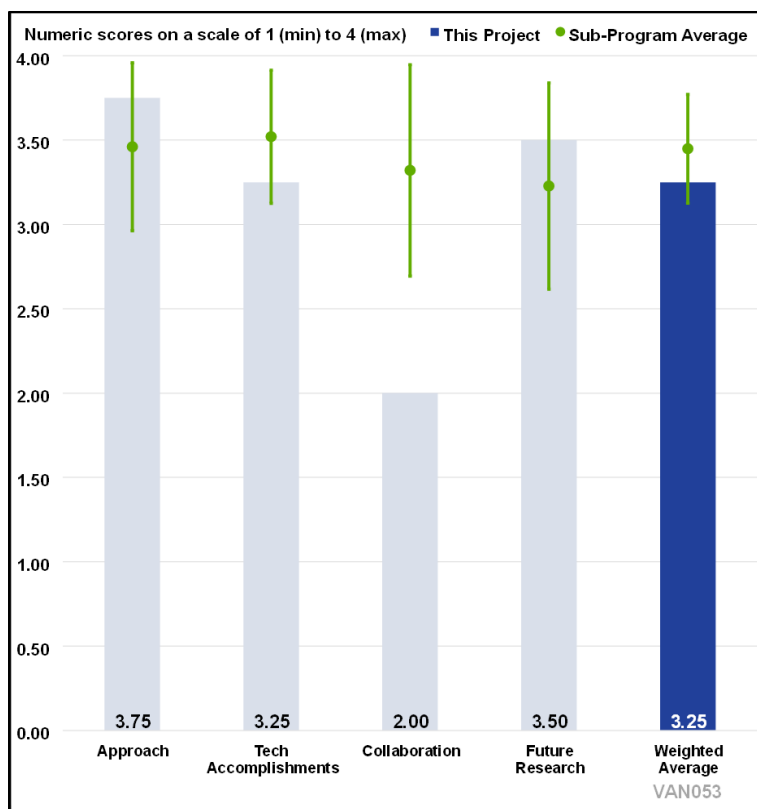
A total of two reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN053\\_Wang\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN053_Wang_2025_o.pdf)



**Figure 7-6 - Presentation Number: VAN053 Presentation Title: Medium- and Heavy-Duty Electric Vehicle Load, Operations, and Deployment (HEVI-LOAD) Augmentation for National-Scale Infrastructure Assessment Principal Investigator: Bin Wang, Lawrence Berkeley National Laboratory**

**Presentation Number:**

VAN054

**Presentation Title:**

Managing Increased Electric Vehicle Shares on Bulk Power Systems

**Principal Investigator:**

Brennan Borlang, National Renewable Energy Laboratory

**Presenter**

Elaine Hale, National Renewable Energy Laboratory

**Reviewer Sample Size**

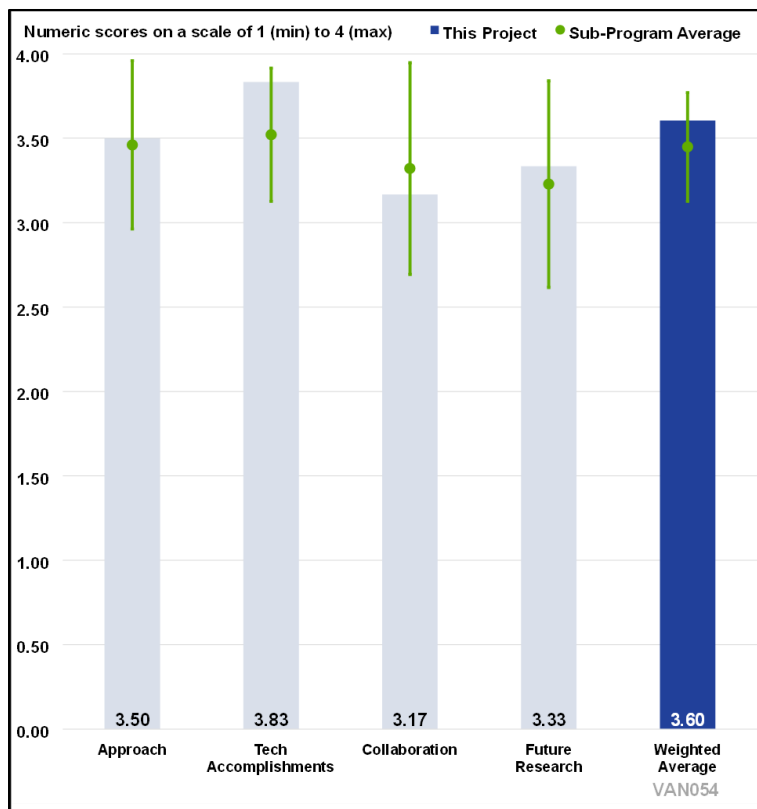
A total of three reviewers evaluated this project.

**Project Relevance and Resources**

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**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN054\\_Borlang\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN054_Borlang_2025_o.pdf)



**Figure 7-7 - Presentation Number: VAN054 Presentation Title: Managing Increased Electric Vehicle Shares on Bulk Power Systems Principal Investigator: Brennan Borlang, National Renewable Energy Laboratory**

**Presentation Number:**

VAN056

**Presentation Title:**

Agent Based, Bottom Up Medium and Heavy-Duty Electric Vehicle Economics, Operation, Charging, and Adoption

**Principal Investigator:**

Thomas Bradley, Colorado State University

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**Presenter**

Thomas Bradley, Colorado State University

**Reviewer Sample Size**

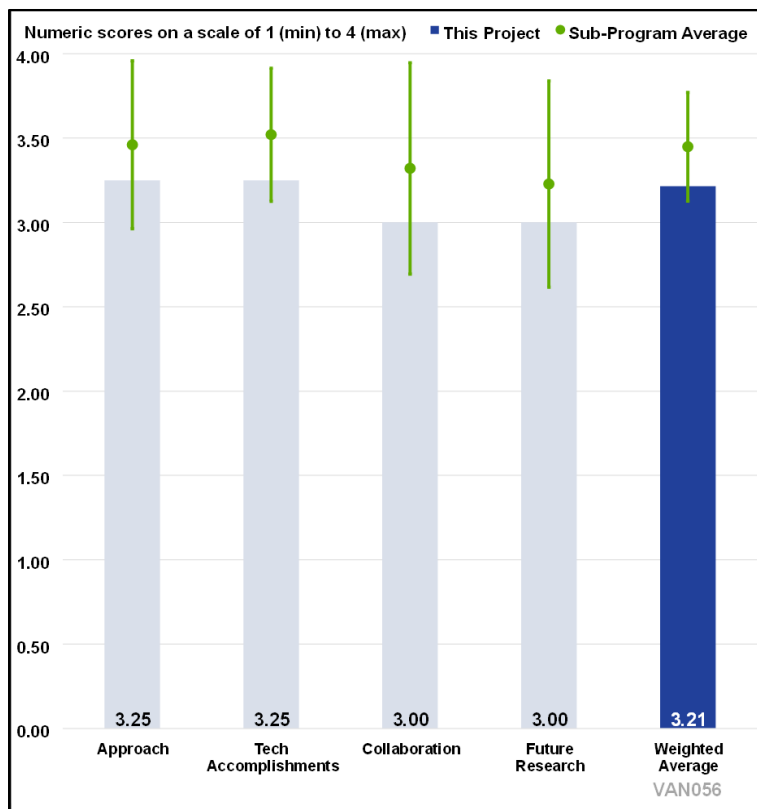
A total of two reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN056\\_Bradley\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN056_Bradley_2025_o.pdf)



**Figure 7-8 - Presentation Number: VAN056 Presentation Title: Agent Based, Bottom Up Medium and Heavy-Duty Electric Vehicle Economics, Operation, Charging, and Adoption Principal Investigator: Thomas Bradley, Colorado State University**

**Presentation Number:**

VAN057

**Presentation Title:**

Scalable Truck Charging Demand Simulation for Cost-Optimized Infrastructure Planning

**Principal Investigator:**

Ann Xu, ElectroTempo, Inc.

**Presenter**

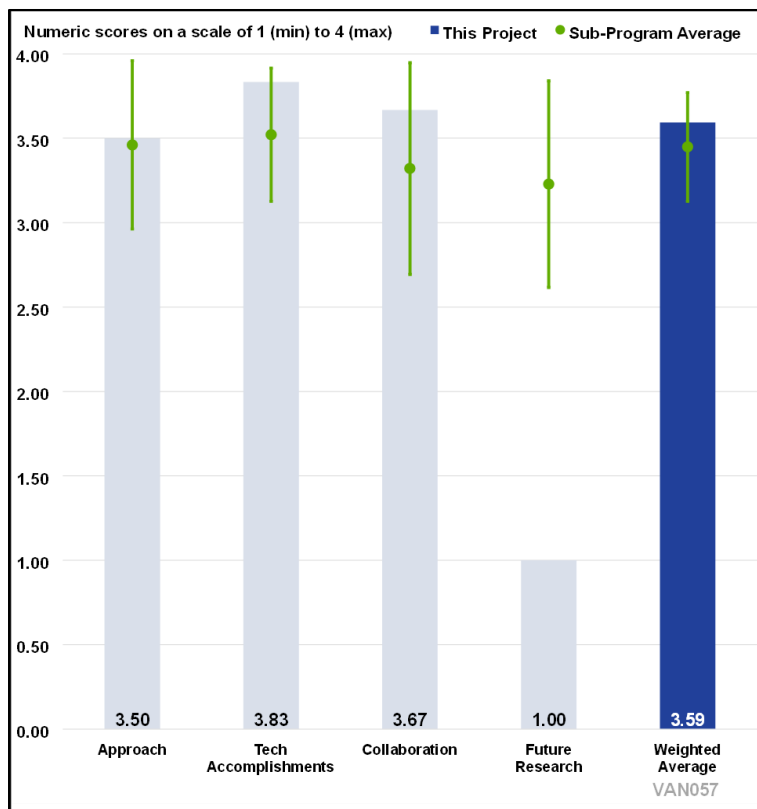
Patrick Finch, Electrotempo, Inc.

**Reviewer Sample Size**

A total of three reviewers evaluated this project.

**Project Relevance and Resources**

100% of reviewers felt that the project was relevant to current DOE objectives, 0% of reviewers felt that the project was not relevant, and 0% of reviewers did not indicate an answer. 100% of reviewers felt that the resources were sufficient, 0% of reviewers felt that the resources were insufficient, 0% of reviewers felt that the resources were excessive, and 0% of reviewers did not indicate an answer.



**Figure 7-9 - Presentation Number: VAN057 Presentation Title: Scalable Truck Charging Demand Simulation for Cost-Optimized Infrastructure Planning Principal Investigator: Ann Xu, ElectroTempo, Inc.**

[DOE Program Clarification: Reviewers noted the project work is complete, and the project has ended. Results and data from this project will be publicly available.]

**Presentation Link:**

[https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025\\_AMR/VAN057\\_Xu\\_2025\\_o.pdf](https://www1.eere.energy.gov/vehiclesandfuels/downloads/2025_AMR/VAN057_Xu_2025_o.pdf)

For more information, visit: [energy.gov](https://energy.gov)

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