

Livewire Data Platform – A Solution for EEMS Data Sharing

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OVERVIEW

The Livewire Data Platform provides:

- A platform allowing easy and secure data sharing and discovery using both human website and computer-accessible application programming interface (API) formats.
- A community for building partnerships and collaboration around data in order to find answers to today's biggest mobility challenges.
- A system allowing shared data to grow in size and complexity as DOE's Energy Efficient Mobility Systems (EEMS) program evolves.

RELEVANCE

- Data is a critical need for the EEMS research community and while many projects generate data, there are few ways to share data and no standard ways to find data.
- EEMS researchers produce data as a result of the technologies they study and this data can be applicable as an input, or an enhancement to another researcher's work.
- To bring about fundamental changes in our transportation system, data sharing must be endemic.
- The Livewire Data Platform represents a paradigm shift for the EEMS program by providing its researchers with the data needed to generate results and answer big questions.

SUMMARY

- More than 20 interviews have been conducted, validating that an EEMS data platform is necessary
- A catalog of more than 43 EEMS-relevant datasets have been identified
- By leveraging two existing successful platforms (<https://a2e.energy.gov> and <https://api.data.gov>), the Livewire Data Platform can be built efficiently
- Data will be protected behind an authentication process and usage of data will be gathered for both API and data downloads.
- Three datasets will be available by the end of June—Mobility Energy Productivity (MEP), Whole Traveler (WT) survey and the University of Michigan's (UMich) Connected and Automated Vehicle (CAVs) project
- Ten datasets will be available by the end of September 2019
- Involving researchers and partners in the development process will aid in the reduction of human barriers to data sharing
- The EEMS data working group will lead the cultural shift toward data sharing
- The Livewire team continues to engage with EEMS projects and expects to be sharing nine APIs and 20 datasets by September 2020
- Future work includes building complex data management capabilities and tackling difficult legal challenges that hinder sharing.

APPROACH

Leverages Existing Successful Assets



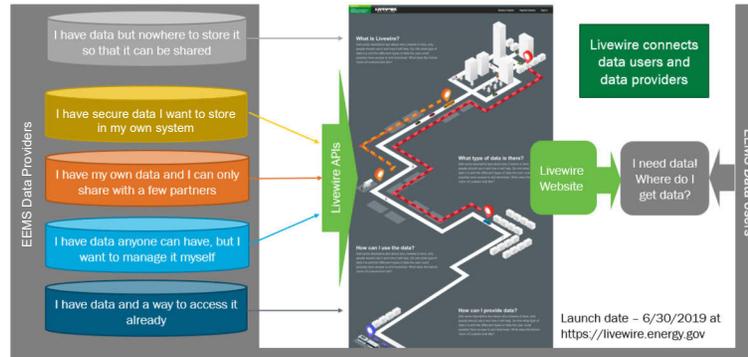
NREL launched api.data.gov in 2013 to support 14 federal agencies. The site has fulfilled 2.1 billion data requests to date.



PNNL launched a2e.energy.gov in 2016 to support DOE's Wind Energy Technologies Office. The site stores 195 TB of project data.

Connects Data Users and Data Providers

- Data providers control who sees their data and receive analytics on how their data is being accessed
- Data users benefit from the ability to easily discover relevant data and forge new partnerships with data owners.



ACCOMPLISHMENTS AND PROGRESS

Cataloged User Needs

- Conducted more than 20 interviews with EEMS researchers
- Compiled a catalog of more than 43 potential datasets that people have or would like to have.

Received Approval from Web Governance Team

- Public Affairs, Legal, and Design approval received in Q2 2019

Software Development in Progress

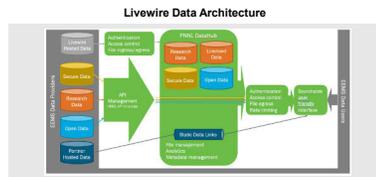
- Beta launch in June 2019 and full launch in September 2019

Data Sharing (In Progress)

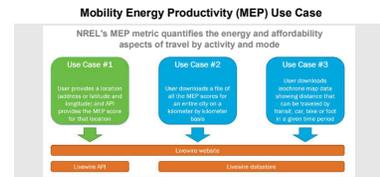
- Three initial datasets are identified for June release:
 - MEP
 - WT
 - UMich's CAV project.
- Developing use cases for additional datasets that will either be hosted or linked to Livewire
- Explored researcher development stack options and decided on Amazon Web Service (AWS) Lambda/Chalice/Python for initial API development and deployment.

EEMS Data Working Group (In Progress)

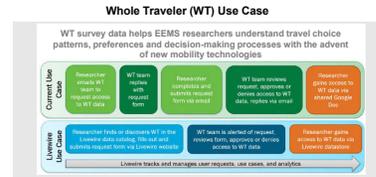
- Leading the cultural shift toward data-sharing among labs
- Prioritizing data needs and requests across tasks
- Ensuring data availability via Livewire data platform
- Preparing to tackle legal barriers to data sharing (year 2)



Livewire leverages the existing NREL API umbrella platform and the PNNL DataHub to make data discoverable to the EEMS research community.



MEP data exposed via the Livewire Data Platform will satisfy three use cases for EEMS researchers.



WT data sharing via the Livewire Data Platform will alleviate the data management burden for the project team and provide valuable analytics on how project data is being leveraged.

Project Tasks and Schedule			
Task Description	Responsibility	Project Year	Status
Task 1 – Create data management platform and expose datasets	NREL, PNNL, INL	1, 2	On track – Beta Platform launching 6/30/19
Task 2 – Build complex data management capabilities	NREL, INL	2, 3	On track
Task 3 – Address the human factors limiting data sharing and facilitate a working group	NREL, INL	1, 2, 3	On track

FUTURE WORK/ CHALLENGES AND BARRIERS

- Although many researchers are adept at scripting and are familiar with using APIs, a number of them have never built an API and are unfamiliar with web technologies.
 - The Livewire team will provide coaching and a simple platform to facilitate data sharing.
- Large, complex datasets, such as telematics and driver surveys, requires expansion of the platform to effectively share data. This will be addressed in years 2 and 3 of the project.
- Legal challenges around non-disclosure agreements and licenses make sharing data difficult. This will be addressed in years 2 and 3 of the project.

COLLABORATION AND COORDINATION

DOE EEMS Program

SMART Mobility Lab Consortium

National Renewable Energy Laboratory (NREL)

- Overall Project Management
- Software Development (APIs)
- Complex Data Management
- FleetDNA
- Transportation Secure Data Center (TSDC)
- Partnerships

Pacific Northwest National Laboratory (PNNL)

- Software Development (Data Platform)
- Web Design

Data Providers

- Argonne National Lab (ANL)
- INL
- Lawrence Berkeley National Lab (LBL)
- NREL
- Oak Ridge National Lab (ORNL)
- Globus
- EEMS Living Lab Projects