DOCKETED

Docket Number:	17-EPIC-01
Project Title:	Development of the California Energy Commission Electric Program Investment Charge 2018 â€“ 2020 Triennial Investment Plan
TN #:	215907
Document Title:	Brian Yanity Comments: Feasiblity study of freight railroad right-of-ways for renewable transmission
Description:	N/A
Filer:	System
Organization:	Brian Yanity
Submitter Role:	Public
Submission Date:	2/10/2017 4:51:20 PM
Docketed Date:	2/10/2017

Comment Received From: Brian Yanity
Submitted On: 2/10/2017
Docket Number: 17-EPIC-01

Feasiblity study of freight railroad right-of-ways for renewable transmission

Additional submitted attachment is included below.

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The Energy Commission is currently soliciting ideas and stakeholder input for the 2018 – 2020 EPIC Triennial Investment Plan. For those that would like to submit an idea for consideration in the 2018-2020 EPIC Triennial Plan, we ask that you complete the form below. Submittals are due by **5:00 p.m. on February 10, 2017.**

Part 1. Initiative Description and Purpose:

1. Please provide a brief description of the proposed initiative:

The routing of new transmission lines along freight railroad right-of-ways in Southern California are a concept worthy of study. This concept could be a new source of revenue for the railroads, increase the amount of renewable energy used in California, and improve power grid reliability.
A potential win-win for railroad and electric utility companies, installing overhead power transmission lines along rail lines has long been common around the world for electrified tracks. Such lines have overhead catenary wires used to power trains, along with higher-voltage power transmission lines suspended further above the catenary.

In recent years, the electrification of passenger and freight railroads in Southern California has been studied. The use of a rail corridor for power transmission is possible whether or not the tracks themselves are electrified with overhead catenary. For electrified railways, support structures for the catenary wire can be combined with transmission line structures. Route-specific feasibility and design studies are needed to determine what size transmission lines could be safely accommodated on a particular railroad right-of-way.

2. What technical and/or market barriers would the proposed initiative help overcome? For scientific analysis and tools, what knowledge gaps would the proposed initiative help fill?

Important cost savings can be realized through coordinated efforts to codeploy rail electrification infrastructure and transmission lines for the interregional sharing of renewable energy. Rail electrification will require high- voltage transmission lines with capacity of 115 to 345 kV, and substations every 20 to 50 miles to transfer power from the transmission grid to the overhead catenary lines that supply power to trains. In more remote areas, the railroad will not be able to tap into the local grid, and will have to provide its own transmission lines. Most railroad right-of-ways are 100 feet or more wide.

This allows for multiple tracks and high voltage transmission towers that could carry far more energy than is required by trains. Many of the ownership and environmental impediments that slow approval of new transmission lines can be avoided by using transcontinental rail corridors. These lines occupy lands that are owned by a single entity and have served industrialized uses for more than a century.

Part 2. Benefits and Impacts

3. If this initiative is successful, either fully or partially, what would be the expected impact? Who are the primary users and/or beneficiaries?

-Freight railroads in Southern California could gain extra revenue by providing transmission/distribution right-of-ways and grid support services to electric utilities.

-Electric utilities would benefit from being able to transmit or distribute power via rail rights-of-way, and from electric energy storage systems sited at freight rail facilities. By dealing with a single landowner instead of hundreds, new transmission could be erected in a far shorter timeframe. Utilities would also have a new customer immediately underneath their wires.

-The public would benefit increased use of renewable energy enabled by new transmission corridors, and from transmission corridors

4. Describe what quantitative or qualitative metrics or indicators would be used to evaluate the impacts of the proposed initiative:

The increase in renewable energy utilization from new transmission corridors routed along railroad corridors (MWh/year).

Energy cost savings from new transmission ($/MWh)

5. Please provide a list of peer-reviewed references that support the responses for questions 3 and 4. Proposed initiatives that include peer-reviewed references will be given stronger consideration.

6. (For technologies only) What competitive advantages does the proposed technology solution have over current benchmark technologies? If the technology is beyond the prototype stage, what strategies do you suggest to bring to scale?

Part 3. Connection to Energy Commission's EPIC Framework
Energy Commission staff have developed a draft strategic framework to guide the CEC's planning and implementation of EPIC across triennial investment cycles. One of the objectives of the draft strategic framework is to communicate a consistent set of priorities for organizing current and future EPIC investments.

7. Please indicate which of the following strategic framework themes you feel the proposed initiative best fits within:
    - Advance Technology Solutions for Deep Energy Savings in Building and Facilities
    - Accelerate Widespread Customer Adoption of Distributed Energy Resources
    - Increase System Flexibility from Low-Carbon Resources
    - Increase the Cost-Competiveness of Renewable Generation
    - Create a Statewide Ecosystem for Incubating New Energy Innovations
    - Maximize Synergies in the Water-Energy-Food Nexus
    - Develop Tools and Analysis to Inform Energy Policy and Planning Decisions
    - Catalyze Clean Energy Investments in California's Underrepresented and Disadvantaged Communities

If Other, Please Specify

Reduce energy consumption and air pollution from the transport of goods and bulk freight in Southern California.