

## DOCKETED

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**Smart Wires, Inc. Comments on the December 17, 2015 RETI 2.0 Plenary Group workshop, Response to Planning Goals Question 3**

*Additional submitted attachment is included below.*



January 7, 2016

California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814

**RE: Docket: 15-RETI-02** – Smart Wires, Inc. Comments on the December 17, 2015 RETI 2.0 Plenary Group workshop, Response to Planning Goals Question 3

Dear Members of the California Energy Commission:

Smart Wires Inc. (“Smart Wires”) is a California-based grid solutions company that designs, manufactures, and delivers modular power flow control solutions for transmission systems. Smart Wires is pleased to offer these Comments to help the California Energy Commission (“Commission”) meet the Renewable Energy Transmission Initiative (RETI 2.0) objective to “build understanding of transmission implications of renewable scenarios, and identify common transmission elements.” As explained below, advanced power flow control, which among other things eases the integration of renewable energy resources on the transmission lines, should be used by the Commission as an integral component in meeting California’s statewide greenhouse gas (GHG) and renewable energy goals while building a smarter transmission system.

Power flow control technologies include traditional devices such as phase-shifting transformers and series reactors, as well as newer advanced technologies such as flexible AC transmission systems (FACTS) and Smart Wires PowerLine Guardian and Tower Router. While traditional power flow control devices are included in planning models, there are aspects of advanced power flow control technologies that are not always represented in current transmission planning processes. For example, many planning models are not capable of capturing the easily dispatchable nature of advanced power flow control technologies. It is important that these planning models can appropriately represent advanced power flow control to enable selection of the alternatives that can best meet California’s future transmission needs.

### **About Smart Wires and Power Flow Control**

Smart Wires’ technology is focused on improving the integration of renewable energy by addressing transmission challenges, such as network congestion. Smart Wires enables each power line to dynamically control and transfer more or less power based on the real-time needs of the grid. By turning the lines themselves into dispatchable assets that can be dialed up or down like a power plant, grid operators can transfer much more power using the existing infrastructure they already have. In addition, power flow control allows grid operators to trade more power with their neighbors, spreading the variability across a wide area. By adding Smart Wires strategically to their grids, grid operators can dramatically lower the investment required to accommodate a much higher penetration of renewable energy.

Simply stated, advanced power flow control technologies push or pull electric power flow around transmission constraints. The benefits of advanced power flow control include, but are not limited to:

- **Reducing network congestion and increase system reliability.** Transmission constraints create economic inefficiency and cause reliability risks. Advanced power flow control can in real-time route power around these constraints, creating value and reducing risk.
- **Increasing capital efficiency of transmission investments.** Power flow control routes power around transmission constraints, increasing the utilization of the existing infrastructure and reducing the need for additional transmission. This reduction in transmission investments increases the capital efficiency of the transmission systems.
- **Helping integrate renewable energy.** All of the aforementioned benefits of power flow control mean that the transmission upgrades needed to integrate renewable energy can be done in the most cost-effective manner and with the least cost to consumers.
- **Reducing the environmental impact of transmission investments.** Traditional transmission investments can have large negative environmental effects. Advanced power flow control can reduce or eliminate the need for new line construction, line voltage upgrades, and re-conductoring. Advanced power flow control can be installed with little to no environmental impact. For example, Smart Wires recently completed a helicopter installation of its PowerLine Guardian, allowing for installation without disturbing an environmentally sensitive area.
- **More robust investments through incremental investment, quick deployment, and redeployment.** Advanced power flow control technologies are flexible in three ways that traditional investments are not: i) they can be modular, allowing for an incremental investment strategy; ii) they can be deployed quickly, shortening the planning cycle from years to months; and iii) they can be easily removed and redeployed, ensuring the devices are always optimally placed in the system. Modular power flow solutions create a flexible power system and smarter investments, which ensures that California rate-payers are getting the most reliable and cost-effective transmission system while delivering low GHG electricity.

Advanced power flow control technologies, such as Smart Wires, can be a key element of the transmission planning process and lead to solutions that optimize capital expenditure, improve the integration of renewable energy, address uncertainty in planning transmission, and reduce network congestion. Smart Wires works closely with utilities and transmission-owners to design and develop a dynamic grid that is reliable, affordable, safe, and clean.

### **How the Commission Can Include Power Flow Control As Part of the RETI 2.0 Process**

In its request for Comments, the Commission specifically requests information on the data sources or analyses that it should include in the RETI 2.0 process (Planning Goals Question 3). In order for the Commission to fully recognize the range of possible transmission solutions available, the Transmission Technical Input Group, CAISO, and other stakeholders should include advanced power flow control technologies in transmission planning analyses and better understand the impacts of modular power flow control. There are a number of initial steps that the Commission should consider, such as:

- **Verify that the CAISO's planning models appropriately represent advanced power flow control.**<sup>1</sup> Advanced power flow control technologies are more easily dispatched, have greater granularity and accuracy in dispatch, and allow for more intelligent control than traditional power flow control technologies. We would ask that the Commission and CAISO verify that these differences can be appropriately represented, or approximated, in CAISO's planning models and software.
- **Ensure that advanced power flow control is included in the potential set of transmission alternatives,** in addition to the traditional upgrade options. It is important that the RETI 2.0 process considers advanced power flow control as a feasible option to allow selection of alternatives that can best meet California's future transmission needs.
- **Ensure that investment decisions appropriately compare the different transmission investment options.** This can be done by including considerations such as long-term rather than just up-front costs, impacts and benefits to rate-payers and the environment, and valuing the many additional benefits of advanced power flow control including the optionality that is created by the incremental, modular, and re-deployable nature of Smart Wires devices.

## Conclusion

We appreciate the opportunity to participate in and submit comments to the RETI 2.0 process. RETI 2.0 comes with the implicit responsibility to find the best possible investments on behalf of the California rate-payers. As detailed herein, advanced power flow control, and Smart Wires specifically, can help meet California's energy goals in a cost-effective manner. We therefore respectfully suggest that the Commission ensure that advanced power flow control can be appropriately included into the RETI 2.0 process.

Sincerely,

Gregg Rotenberg



President  
Smart Wires, Inc.

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<sup>1</sup> Planning models are representations of the electric power systems that allow the transmission planner to forecast the future needs of the transmission system. These models require inputs such as load forecasts; forecasts of which generators will be online and available; the current transmission topology; and a set of feasible elements that can be added to the transmission network to meet future needs. It is important that these planning models can appropriately represent advanced power flow control, otherwise the planning process precludes the selection advanced power flow control as solution to meet California's future transmission needs.