CTC GLOBAL

November 21, 2016

Ms. Rajinder Sahota, Branch Chief
Climate Change Program Evaluation Branch
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: AB 32 Scoping Plan Update: Energy System (Electric)

Dear Ms. Sahota,

CTC Global, a California company headquartered in Irvine, appreciates the opportunity to comment on this AB 32 Scoping Plan Update. Specifically, we would like to focus attention on the enormous untapped potential for *improving the efficiency* and *increasing the capacity* of California's high voltage network – improvements that directly support the State's goals for CO^2 reduction and the need to connect large amounts of Renewable Energy to the electric system. There is a commercially available class of High Performance Transmission Conductors (HPTCs, including CTC Global's ACCC®) that substantially reduce line losses while increasing transfer capacity. These HPTCs can be applied in existing rights-of-way (ROW) in a re-conductoring strategy (modern HPTC replacing old, inefficient conductor) to significantly reduce transmission losses and increase ROW capacity by up to 2X. And when new or expanded ROW is required, the HPTC products bring lower life-cycle costs with lower transmission losses, increased transmission resiliency, and substantially more capacity than using traditional conductor.

Energy Efficiency and Added Capacity in Existing Right-of-Way

Billions of dollars have been spent on improving thermal efficiency of power plants and creating new technologies in power generation. Billions of dollars have been spent on improving efficiency and creating new, high efficiency products for end-uses. But, the electricity moves from generator to consumers over inefficient and outdated conductor technology. These commercially available, modern HPTCs can improve the efficiency of the transmission & distribution (T&D) system. Using a HPTC such as ACCC@, the losses on the existing California T&D system could be reduced by 25% or more through a reconductoring effort in existing right-of-ways using existing towers: replacing old transmission conductor technology with the same diameter and weight of modern, high-efficiency conductors. Such a reconductoring effort would bring lower energy costs to all consumers and would reduce California's CO^2 emissions by over

1 million tons per year[1] (as well as lowering other air emissions and reducing water consumption at thermal power plants). Energy efficiency is the preferred action in the California loading order to meet growing energy needs. This should include the increased efficiency of the T&D system that makes more energy available by reducing its waste in T&D losses.

The modern HPTCs also bring substantially increased capacity on those same reconductored ROW corridors. Generally, products in this class of transmission conductor can move up to 2 times the amperage of the old conductor it replaces without line sag violations or failures. This adds substantially improved resiliency to a system that is expected to have dramatically changing load flows as old thermal plants are closed down and many more renewable power plants (in other locations) are brought online. This adds increased confidence that unexpected load flow changes or electric system upsets can be accommodated by the reconductored lines without service interruptions.

New or Expanded Right-of-Way

Even after we have maximized the potential of the existing ROW, some new transmission lines will likely be necessary. These lines may be "feeder" lines to connect new renewable power plants to the grid in the state or may be major pathway upgrades for importing or delivering renewable energy. For either application, the products in the HPTC class of conductors are more efficient (delivers more renewable energy) and add greater capacity (and greater resiliency). And, for many conductors in the HPTC class, there is the potential for significantly lower installed and life-cycle costs than using old conductor technology.

Recommended Actions

1) The Scoping Plan should explicitly recognize the benefits of increasing the efficiency of the system that delivers electricity from the power plants to the consumers. And, modern High Performance Transmission Conductors (HPTC) provide a way to predictably reduce the transmission losses and reduce the air emissions.

2) The ARB should review a policy-driven reconductoring strategy as a tool for meeting GHG emission reduction targets by improving efficiency (reducing transmission losses) and improving system resilience by having substantial capacity within the reconductored existing ROW. This additional capacity in the existing ROW can enable more renewable resources to interconnect before more substantial ROW upgrades are required. This policy-driven reconductoring approach supports Garamendi Principles #1 and # 2: summarized together as "get the most out of the existing ROW".

[1] 2014 Energy Information Administration (EIA) data for electric losses in California shows 7% transmission and distribution (T&D) losses. With total California 2014 generation (minus direct use) of 199,996,478 MWh, this equals about 13,999,753 MWh of T&D losses in the 2014 electric grid. 25% T&D loss reduction equals 3.5 million MWH that did not have to be generated which would save fuel costs to customers, free-up 500 MW of generating capacity, and reduce CO^2 emissions by1.0 million tons per year (at 2014 California emission rate).

3) The ARB should consider establishing an efficiency standard for the T&D system. Energy efficiency standards have been established for appliances, building, and automobiles. They should be considered for the electric delivery system. Standards eliminate the least efficient products and practices from the marketplace and can secure large benefits for California's consumers. CTC Global is aware that the state's utilities are the entities that propose transmission projects and chose the type of conductor that they will use in the project. But, the ARB along with the CEC, the CPUC, and CAISO can certainly influence that decision by making it clear that improving the efficiency of the T&D grid at every opportunity is encouraged (if not required). This permits the utility to consider more efficient alternatives, such as HPTC, in compliance to the state agencies' guidance rather than attempting to "up sell" the higher efficiency, more resilient, alternatives rather than the "traditional" solutions. The Commission and the other state agencies with a stake in the California GHG emissions can change the transmission planning criteria and change the utility's planning process behavior through its guidance for increasing the efficiency from the transmission system.

CTC Global appreciates the opportunity to participate and add comments to this important Scoping Plan document and emissions reduction process.

Thank-you,

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