



Improving the Nation's Power Grid: Efficiency, Reliability, and Resiliency

(Initiate a T&D Energy Efficiency Policy)

TODAY'S OBJECTIVES



- **T&D Energy Efficiency Policy Initiative: Advocate**
- **Advanced Conductors: Explained**
- **Reduce Line loss and Carbon Emissions: Examples**

Options to Reduce T&D Losses Include:



Change the way the grid is operated



Improve transformer and other substation equipment efficiency



Change the way the structures hold the conductors



Utilize the advantages of high performance / advanced conductors

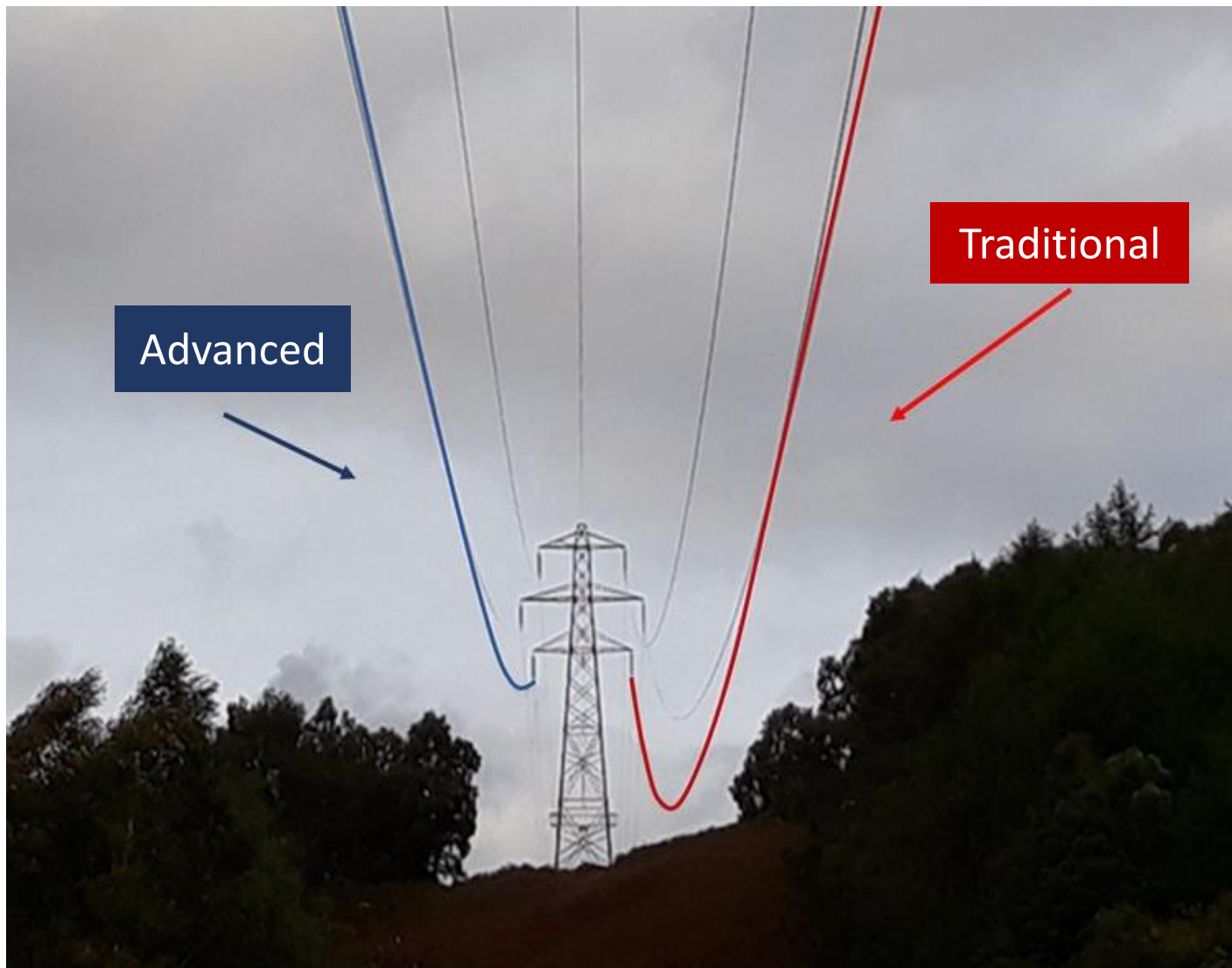


BE CONFIDENT: SOLUTIONS ABOUND



Give guidance to utilities and operators and they will find (many) solutions to improve efficiency within your parameters

Advanced Conductors: Low Sag



Why is thermal sag an issue?

Conductor heating causes expansion. Carrying too much current (causing too much heat) causes the thermal sag to trip and become **extremely dangerous**.

Advanced Conductors can deliver **up to 2 times the capacity** of traditional conductors of same diameter **without excessive thermal sag**

Advanced (low sag) Conductor: Fire Survivability



Increased Resilience



Increased Reliability

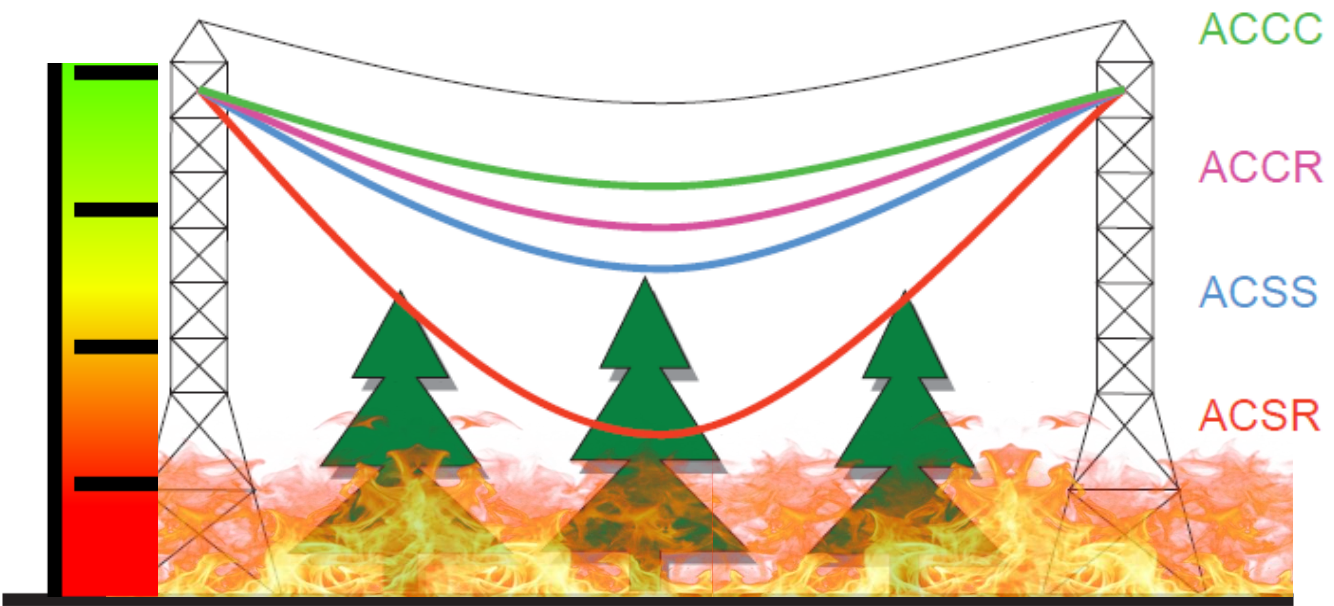


Figure 1: Sag comparison at 180°C

Advanced Conductors: Resilience



**Post-Tornado:
Oklahoma G&E (2016)
Tornado debris.
Conductor stayed
aloft.
2 bucket trucks and
quick return to service.**

**Resilient: Rapid
return to service**

Advanced Conductors: Give Operators More Options

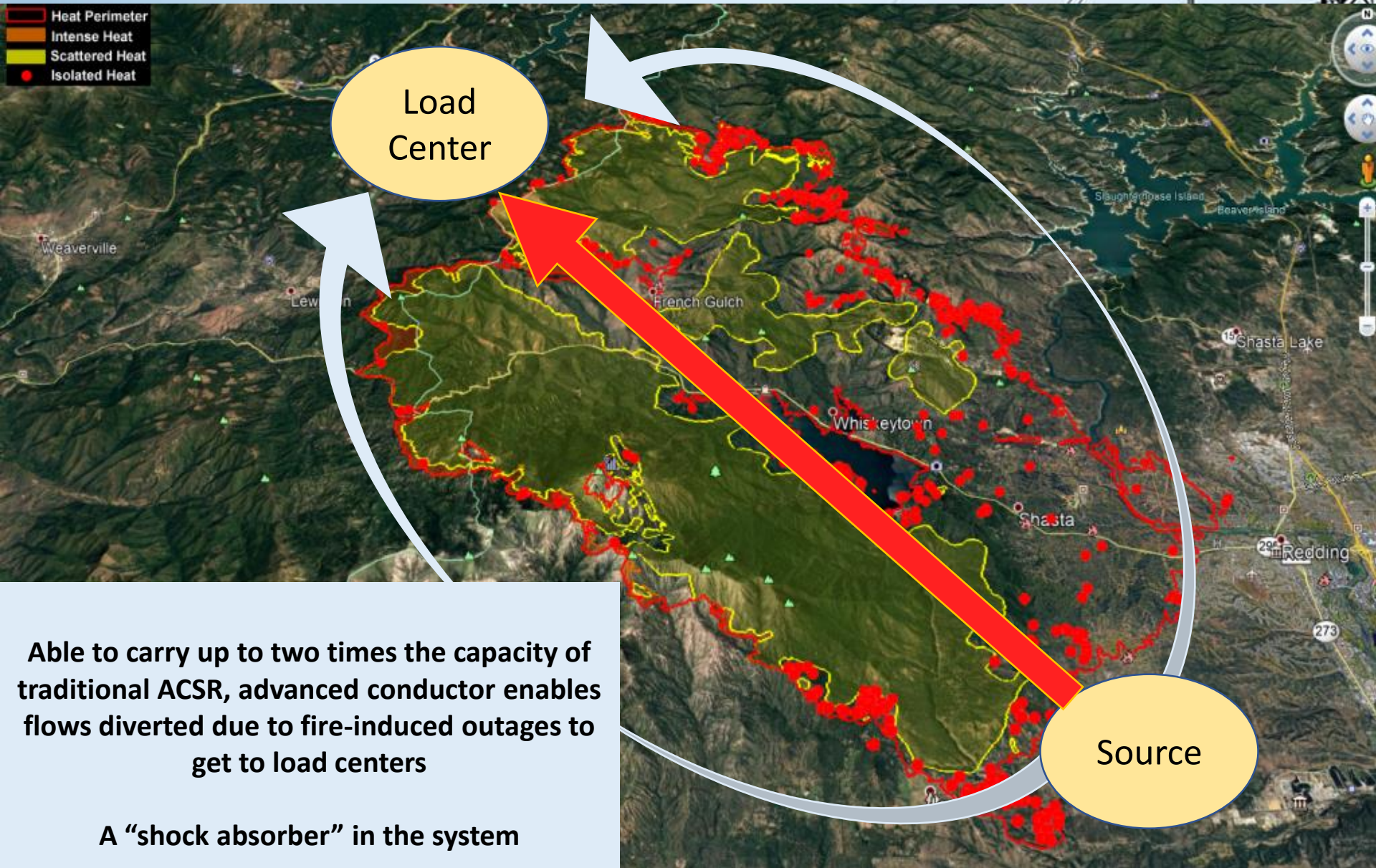
- Heat Perimeter
- Intense Heat
- Scattered Heat
- Isolated Heat

Load Center

Source

Able to carry up to two times the capacity of traditional ACSR, advanced conductor enables flows diverted due to fire-induced outages to get to load centers

A "shock absorber" in the system

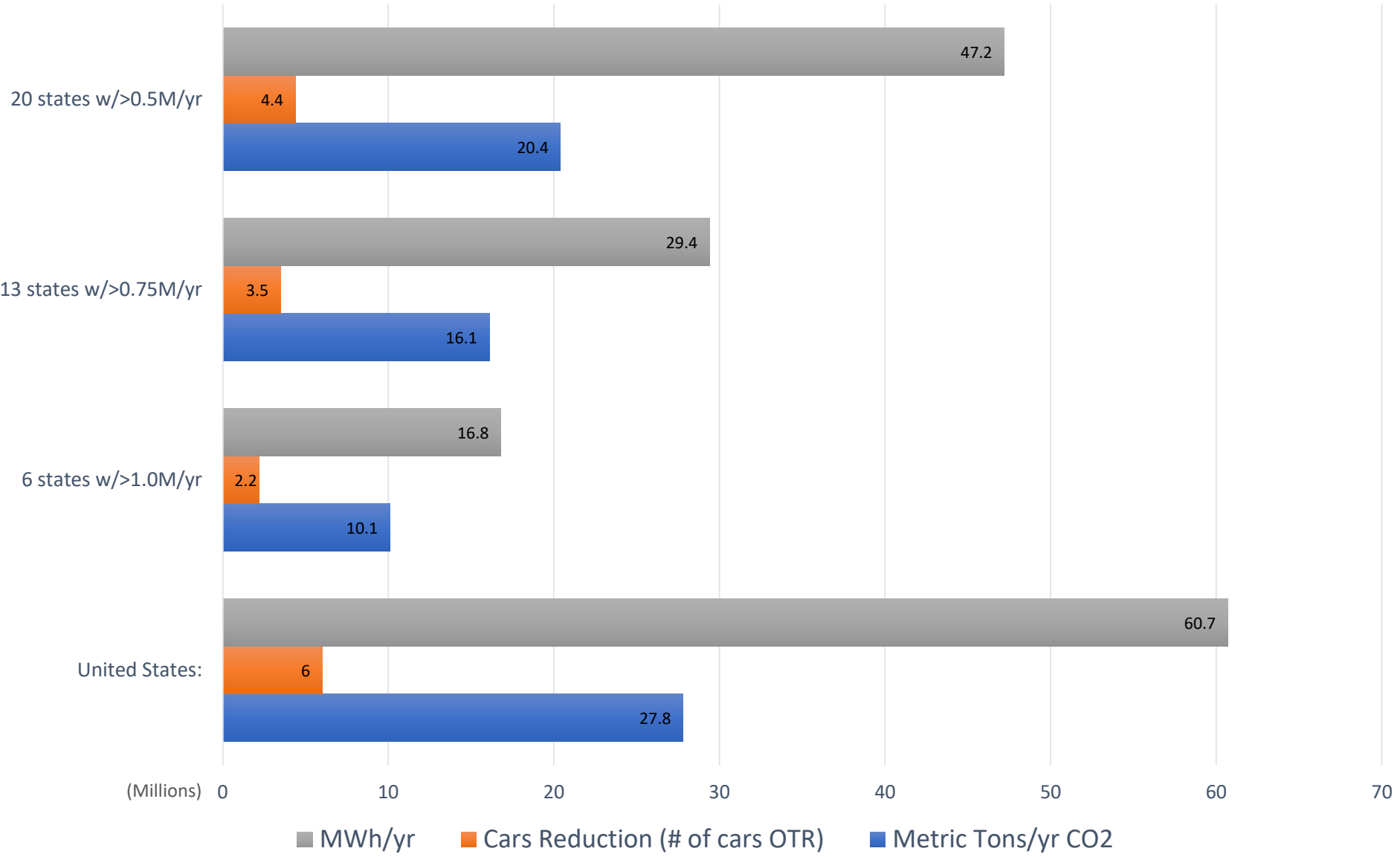


Advanced Conductors: Efficiency



- **Most carry more aluminum for the same diameter versus traditional ACSR**
- **This reduces resistance for the same current flow**
- **Lower Resistance = Lower Losses (@ same current)**
- **Up to 40% lower losses than traditional conductor of the same diameter**
(efficiency varies among advanced conductors)

Carbon Reductions (@ 30% Reduction Target)



Advanced Conductor: Get MORE from existing ROW



- Advanced Conductors can enable more performance on existing ROW. They can provide:
 - More power flow to relieve congestion, improve reliability, and increase resiliency
 - Reduce line loss
 - Line-for-line reconductoring using existing structures (weight matters)
 - 20%-40% lower costs than traditional rebuild solution

• CASE STUDIES:

- AEP
- SCE
- Xcel Energy



SOUTHERN CALIFORNIA
EDISON

Policy Considerations



- **T&D Energy Efficiency Policy Guidance:**
 - Every T&D project should have EE savings included in the Cost/Benefit analysis
 - EE savings should be fully inclusive
 - energy/fuel savings
 - CO₂ savings
 - SO_x/NO_x savings
 - water reduction savings
 - other (e.g. low-income emission reduction impacts)
 - Follow the approved guidance for end-use EE projects
- Incentives: Register T&D EE projects? Allow CO₂ counting?



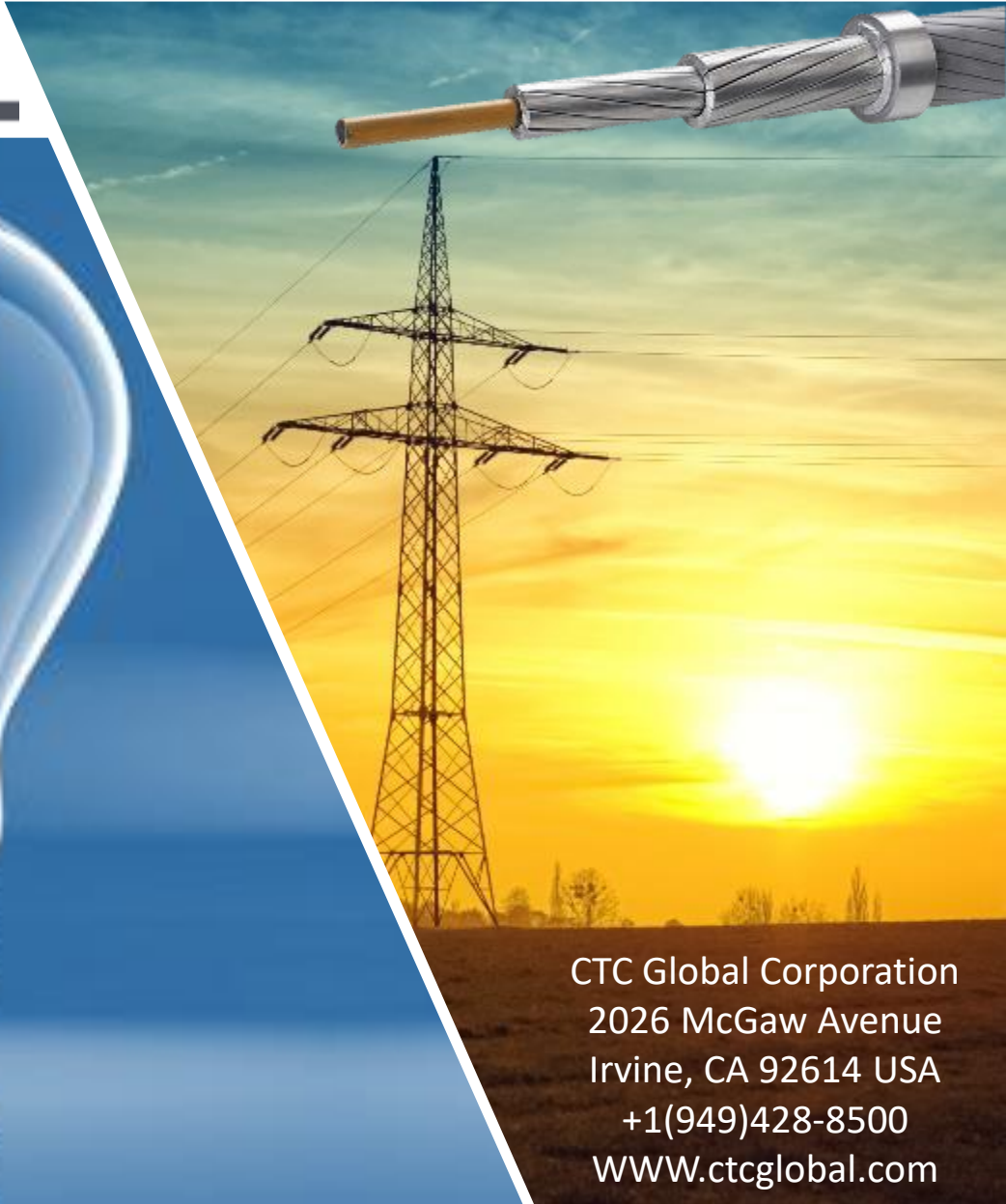
BE BOLD TAKE ACTION

- “Harvest” energy and carbon savings from the overlooked T&D system
- Every utility investment in the T&D system has guidance to increase energy efficiency
- Recognize the magnitude of these savings and benefits
- T&D investments are made every year. Make them count toward a more efficient electric delivery system
- Give guidance to utilities and operators and they WILL FIND SOLUTIONS within the parameters you describe

Thank You

CTC GLOBAL

Questions



CTC Global Corporation
2026 McGaw Avenue
Irvine, CA 92614 USA
+1(949)428-8500
WWW.ctcglobal.com

Link to Navigant Article

RESOURCE:

<https://www.navigantresearch.com/news-and-views/advanced-conductors-are-changing-the-economics-of-new-transmission-line-buildsand-existing-line-upgr>