Steel
Market Development
Institute

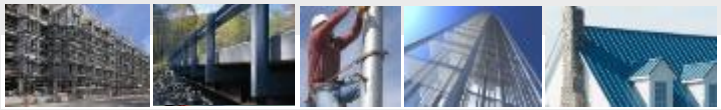
A business unit of AISI
www.smdisteel.org

Utility Pole Overview

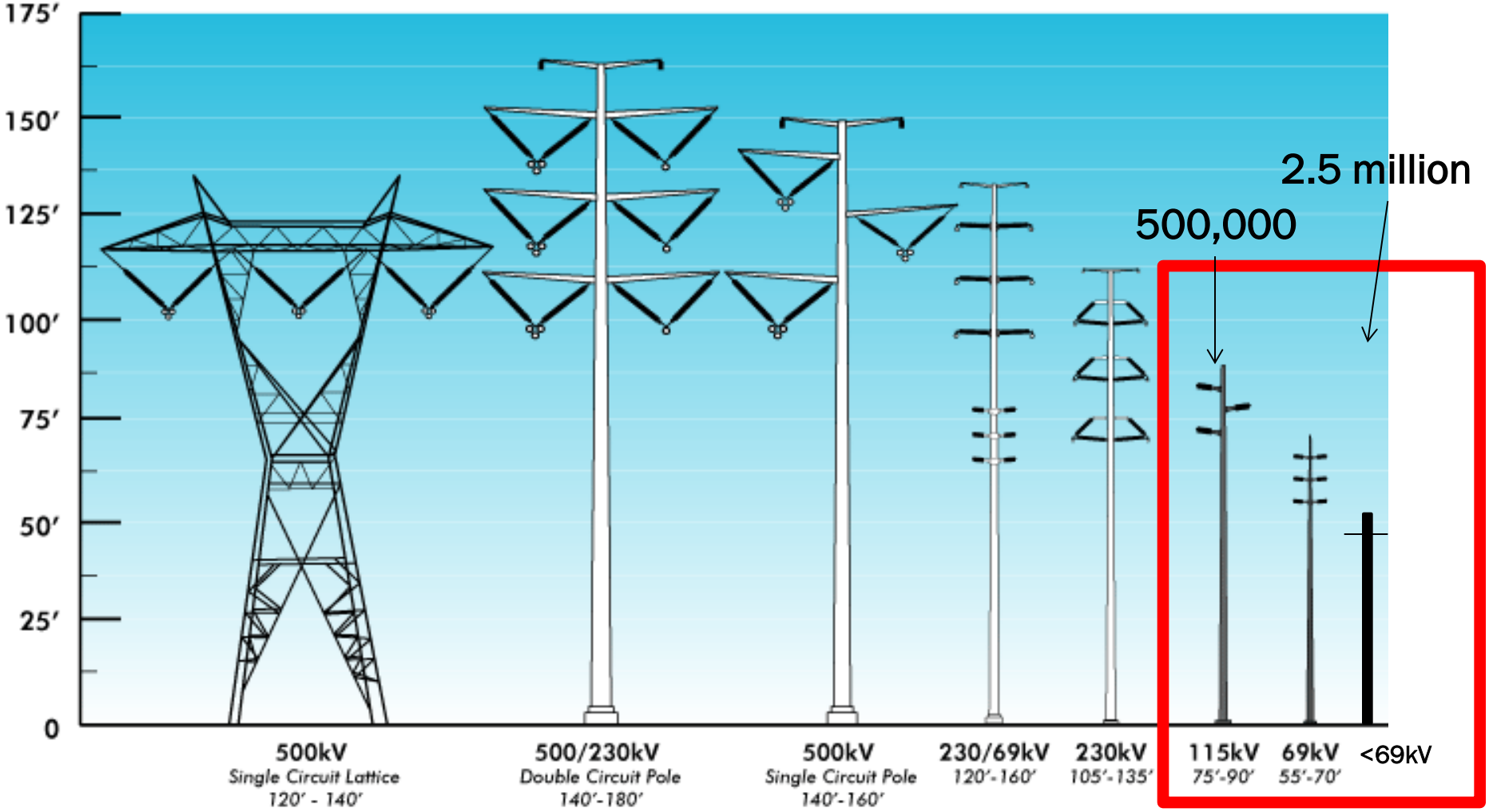
Dan Snyder, Director of Business Development
dsnyder@steel.org / 301-367-6179







Market



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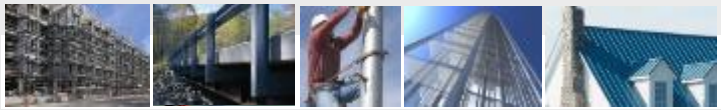

Market

Number of Poles

120 mil. poles
2-3 mil. replaced/year
1.2 mil. Total potential tons

185 mil. poles
4-5 mil. replaced/year
2.0 mil. Total potential tons

Market Share:

- 90% treated wood
- 10% steel, concrete, composite

Steel:

- Over 600 electric utility companies are using steel distribution poles
- An estimated 2 million steel distribution poles have been installed since 2000

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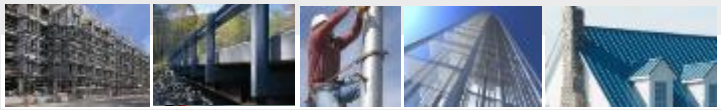

Market

Steel Utility Pole Manufacturing Process:

- Hot-Rolled Sheet
- ASTM A570, A572, A607, A715
- Typically made from 11 gauge steel (.1196-.2092”)
- 40-50’ average length
- Base diameter 7.5-13”
- Top diameter 4-7”
- 5 mils Galvanized Coating (minimum average)
- Polyurethane coating

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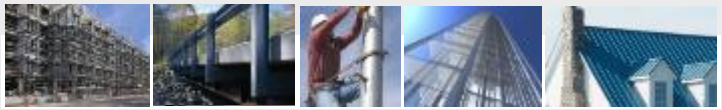
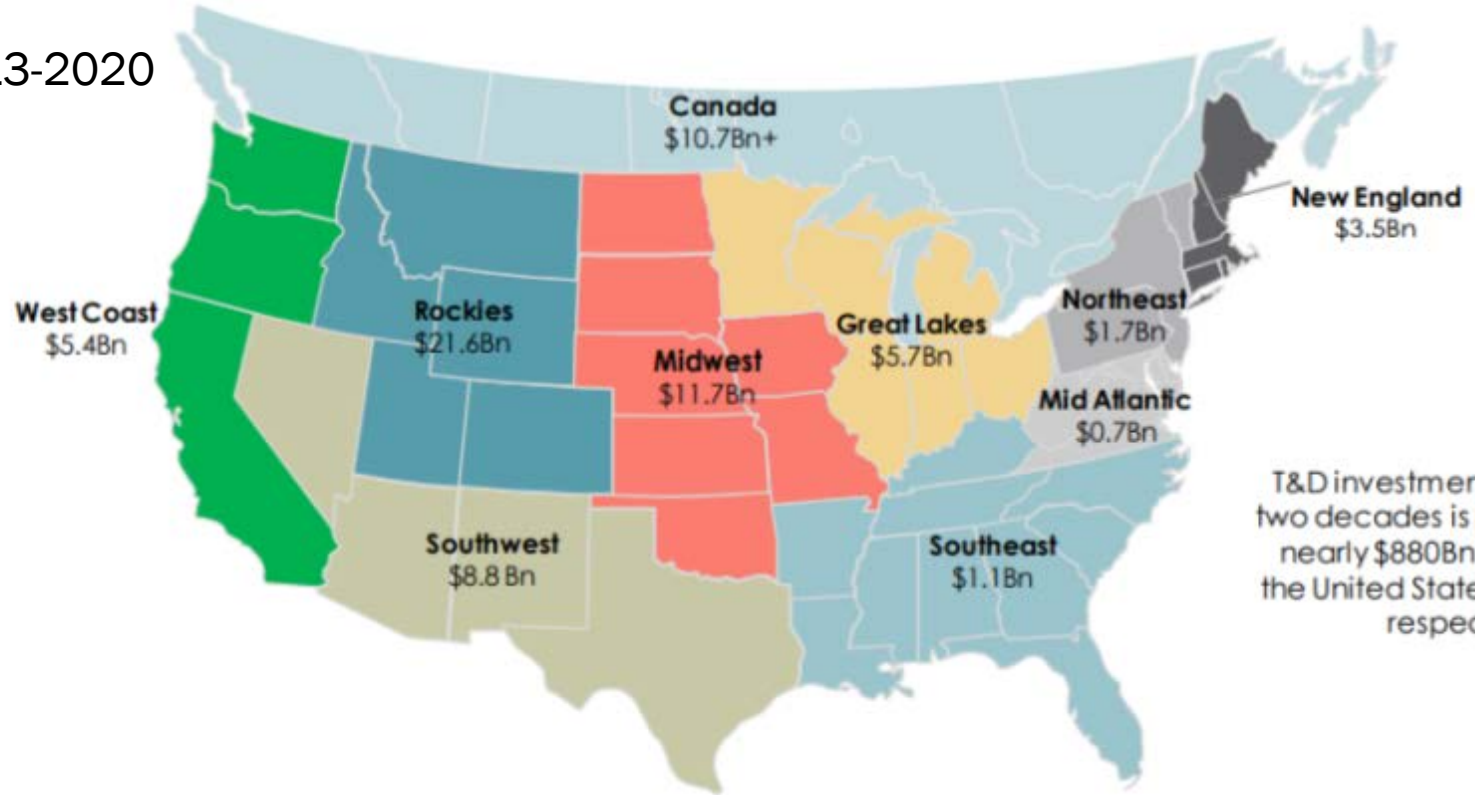


Market

Exhibit 3

Regional Spending Outlook

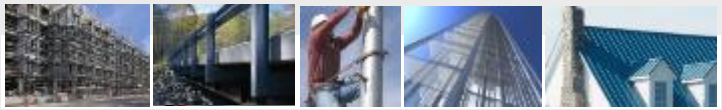
2013-2020



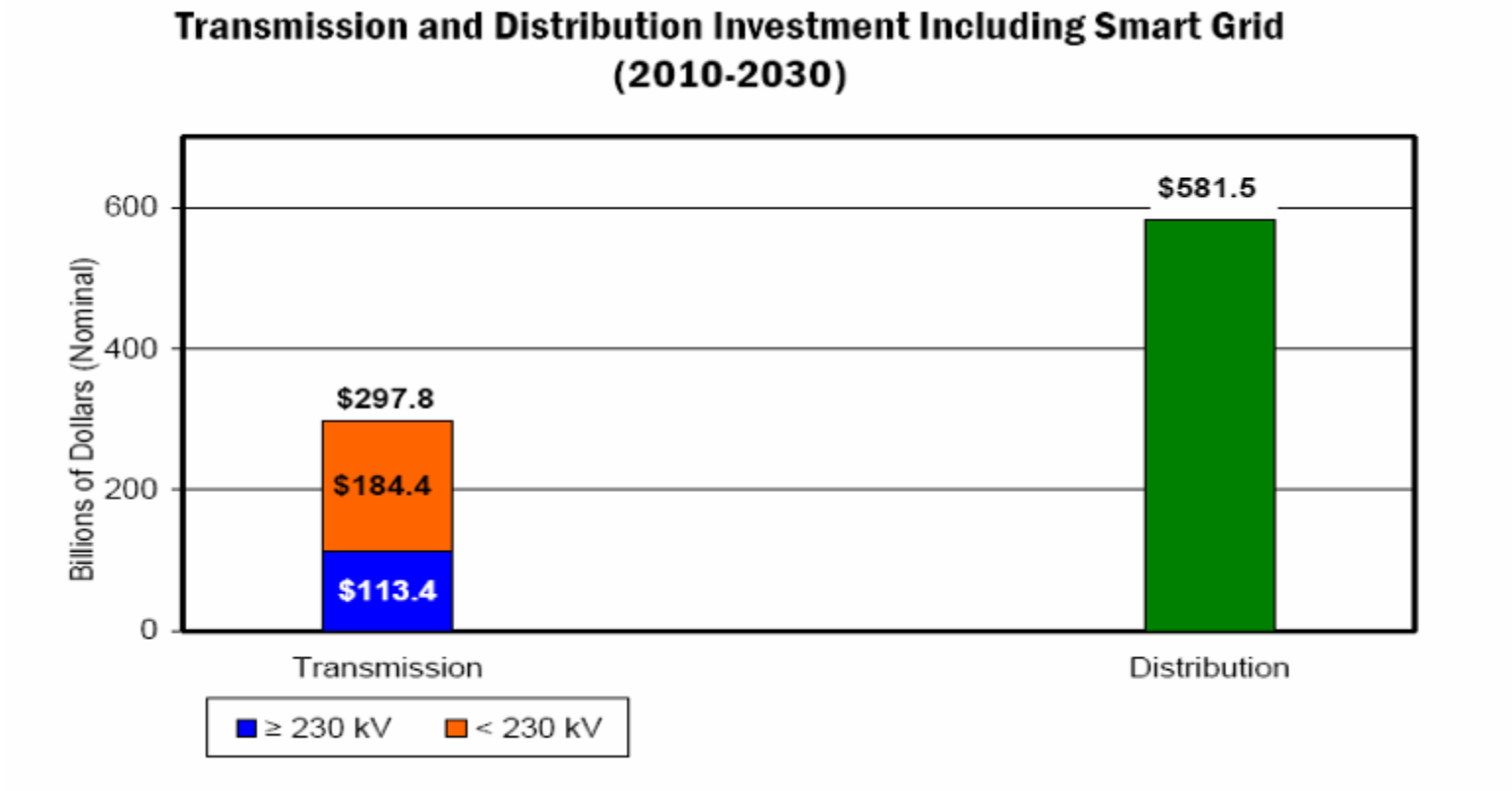
T&D investment over the next two decades is projected to be nearly $880Bn and $100Bn in the United States and Canada, respectively.

Harris Williams & Co.
middle market

Steel Market Development Institute

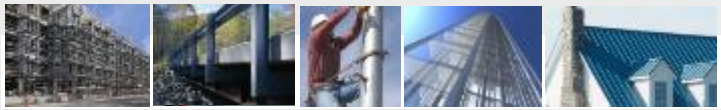


Utility Pole Market



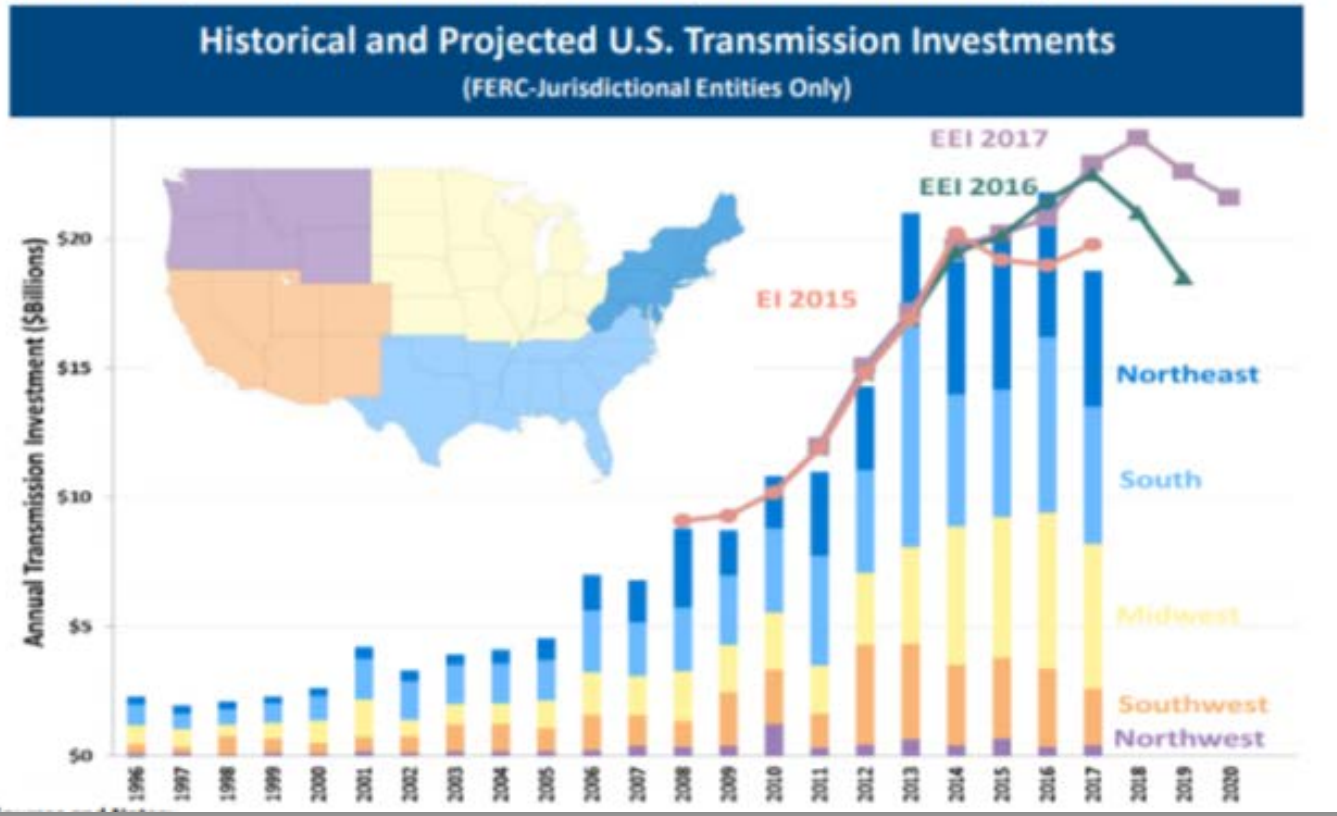
* The Brattle Group

Steel Market Development Institute



Utility Pole Market

U.S. transmission investments have stabilized at approx. **$20 billion/year** in the last five years, after rising steadily from $2 billion/year in 1990s



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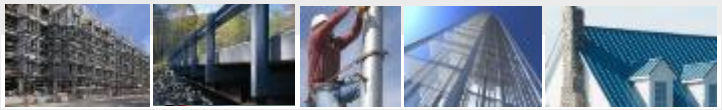
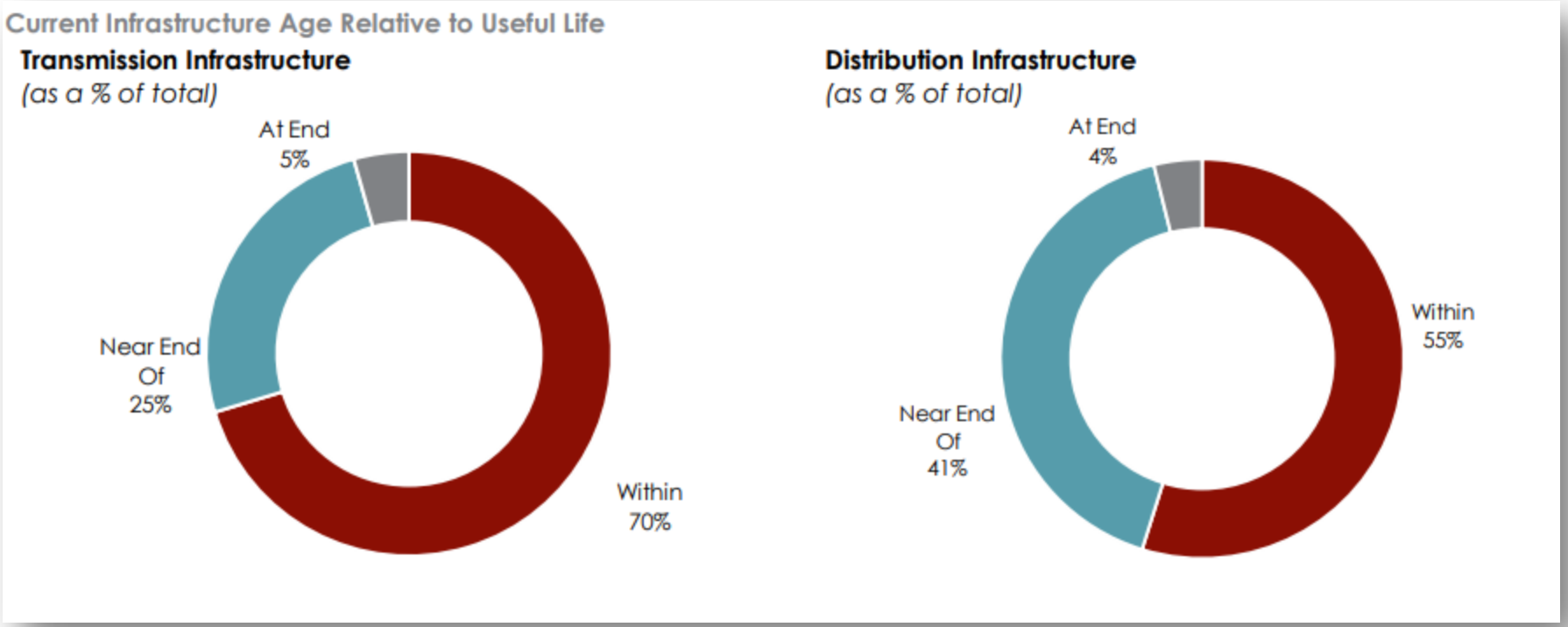


Market



*60% of distribution poles are 30-50 years old

Harris Williams & Co.
middle market

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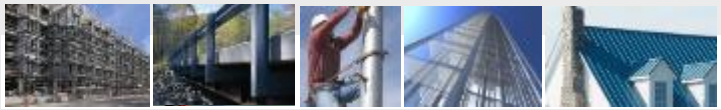

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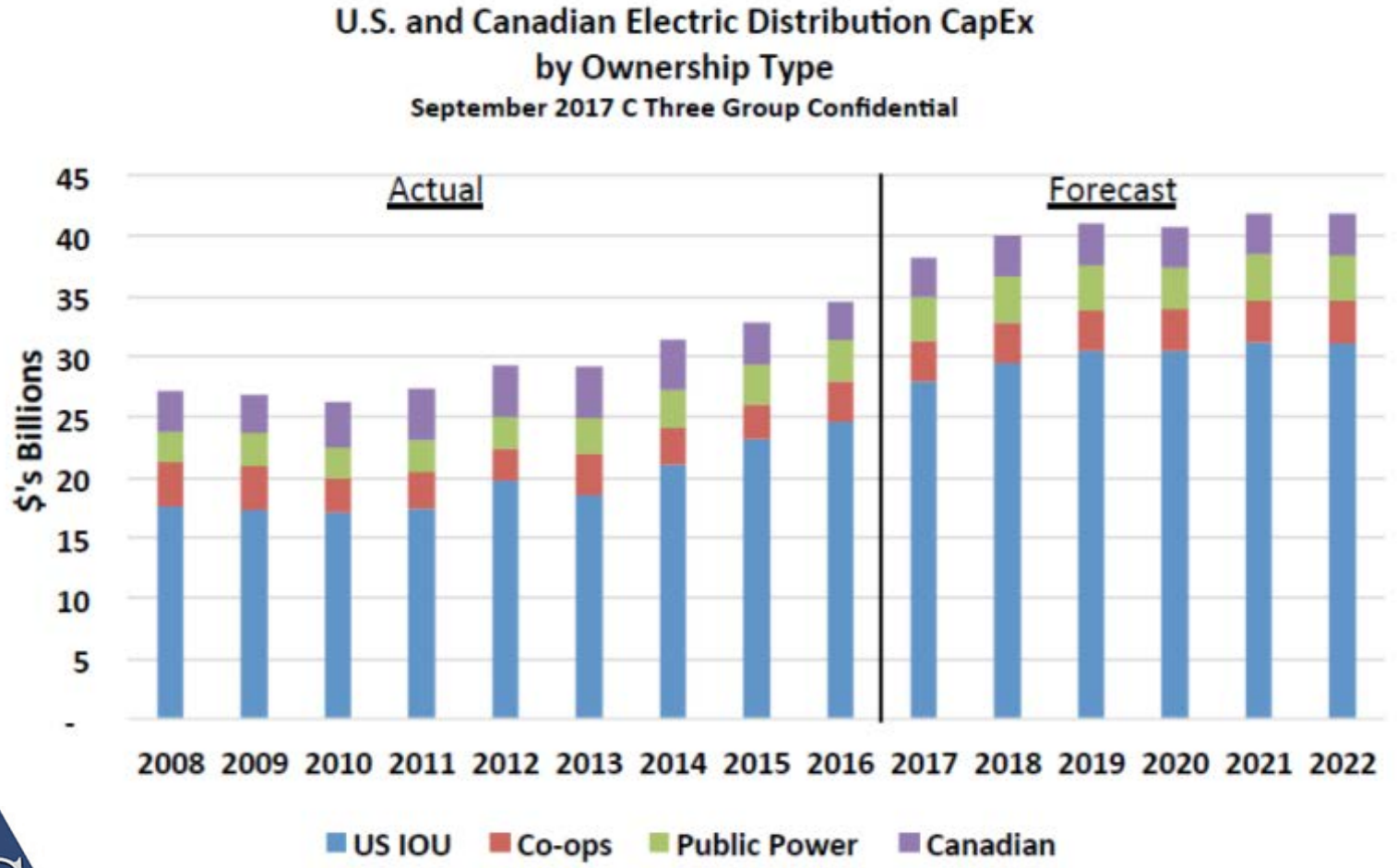

the C three group

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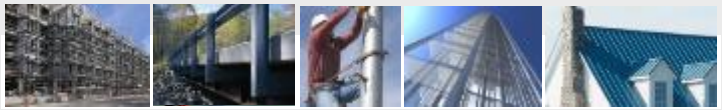

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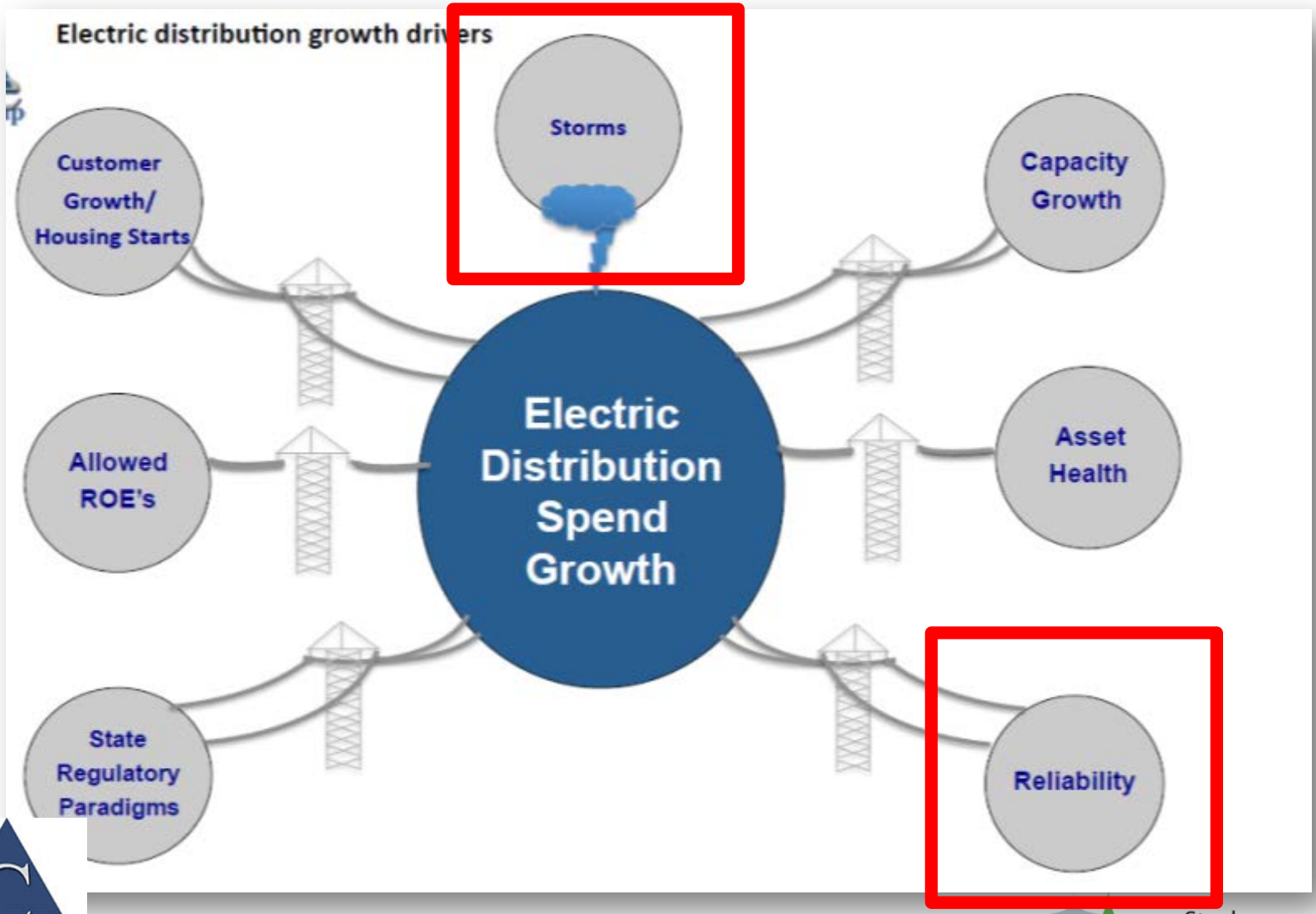
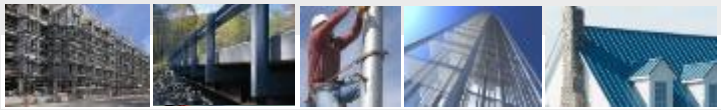
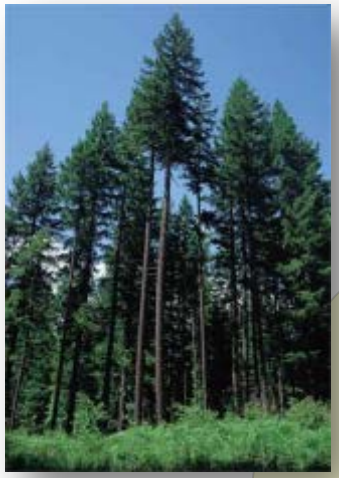
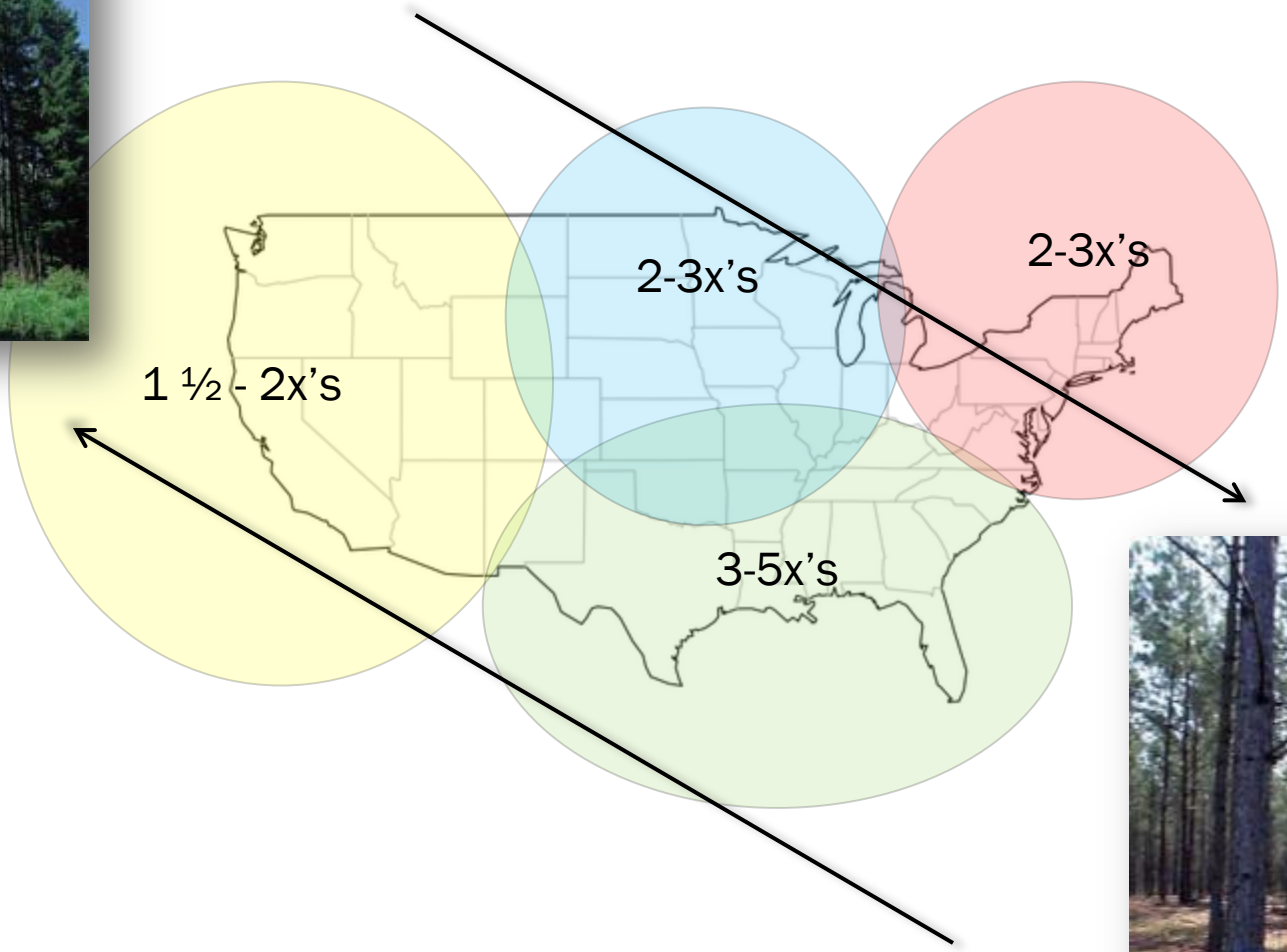

Electric distribution growth drivers
Storms
Customer Growth/ Housing Starts
Capacity Growth
Electric Distribution Spend Growth
Allowed ROE's
Asset Health
State Regulatory Paradigms
Reliability



Marketing

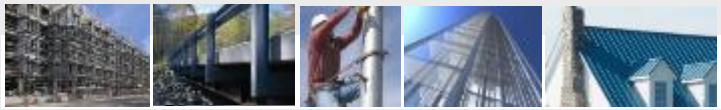


Douglas Fir



Southern Yellow Pine

* Some cedar and "other" pine also used



Task Group

SMDI Steel Utility Pole Task Group - Established 1998

Objective:

Promote the increased use of steel utility poles (wood conversion) in North America.

Investment:

SMDI & Partners have invested approximately $2 million.

Partners:

20+ partners including fabricators, producers, coaters, educators, etc.

** Past Chairman - Keith Lindemulder, Nucor Corporation*

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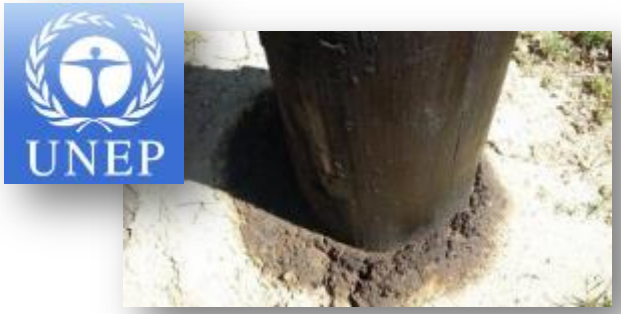
Successes

Environmental



Owner Conversions

SDGE

Westar Energy

TEP
Tucson Electric Power

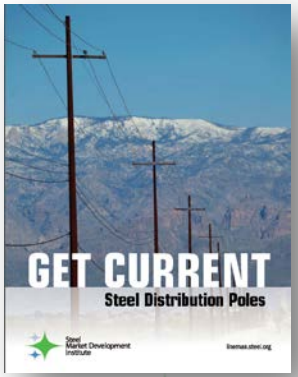
aps

DTE Energy

Training & Education

3500 Trained

Marketing/Research



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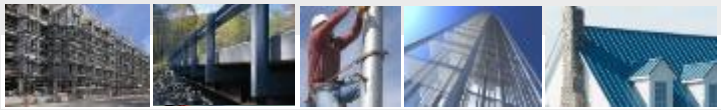

Environmental

1.5 million poles (40%) with pentachlorophenol
(other 60% are Chromated Copper Arsenate or Creosote)

95% of pentachlorophenol consumption in the U.S. is utility poles

The Environmental Protection Agency (EPA) assigned a **cancer risk 3.4 million times higher** than acceptable for people that apply penta to poles in the field

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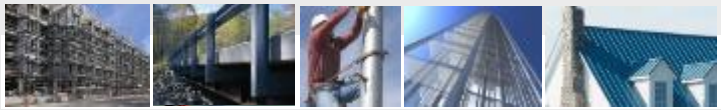

Environmental

United Nations Environment Program (UNEP), through its Conference of Parties (COP), added pentachlorophenol to Annex A (2015)

94 countries voted in favor of global ban

Potential to add 450,000 tons of steel per year

The U.S. is not a signatory to the Stockholm Convention

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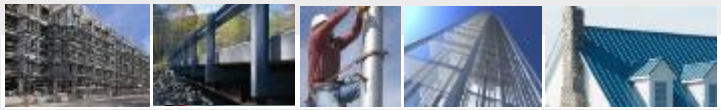

Environmental

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Training

- Less time on engineering details
- More time on “user” experience & operations

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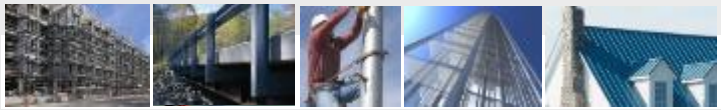

Training & Education

Lineman Retiring *

- 49 Average Age
- Up to 60% expected to retire in near future
- Utility human resources executives overwhelmingly listed the aging work force as their number one concern

Employment projections data for line installers and repairers, 2012-22

Occupational Title	SOC Code	Employment, 2012	Projected Employment, 2022	Change, 2012-22	
				Percent	Numeric
Line installers and repairers	49-9050	249,400	267,700	7	18,300
Electrical power-line installers and repairers	49-9051	114,500	124,700	9	10,200
Telecommunications line installers and repairers	49-9052	134,900	143,000	6	8,100

SOURCE: U.S. Bureau of Labor Statistics, Employment Projections program

* International Brotherhood of Electrical Workers

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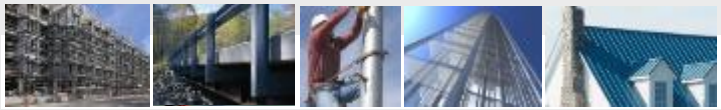

Training

Workshops/Rodeos

Student Linemen

Journeyman Linemen

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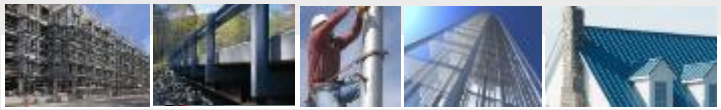

Owners

Duquesne Light
Our Energy…Your Power

FirstEnergy

frontier
Communications Solutions

Duke Energy

Westar Energy

comcast

SDGE

TEP
Tucson Electric Power

FARMINGTON ELECTRIC UTILITY SYSTEM

Bluebonnet

PG&E Pacific Gas and Electric Company

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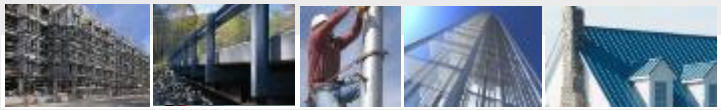

Marketing

Economics

Lighter Weight

Longer-Spans

Reduced Copper Grounding

Less Maintenance

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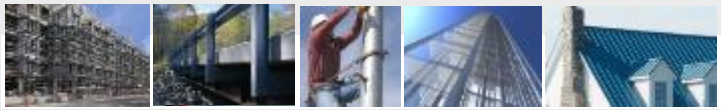

Marketing

Reliability

Woodpecker

Cascading Effect

Fire

Car Strikes

Remote Locations

Ice

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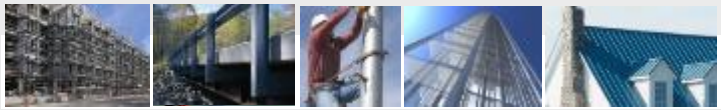


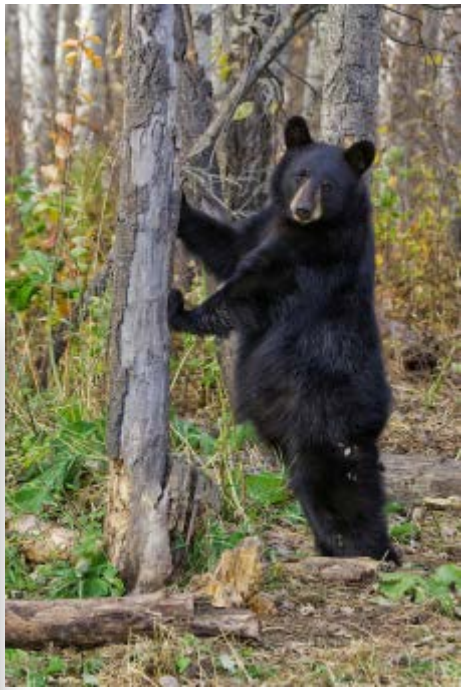
Reliability

...and BEARS!

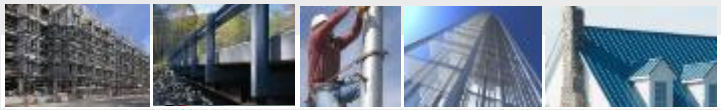
Attached is a picture of a pole that has been scraped up by a bear. This actually wasn't on our system, but this is what a pole looks like after a bear decides to have its way with it. And we have several poles each year that look like this and need to be replaced.

Enjoy.

Wesley Repke
Electric & Gas System Engineer
Presque Isle Electric & Gas Co-Op
Office: (989) 733-8515 x887
E-mail: wrepke@pieg.com



Steel Market Development Institute



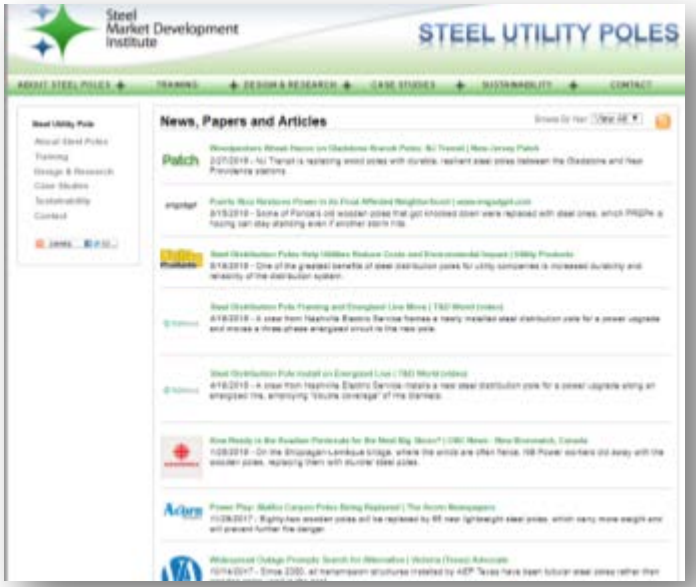
Marketing

Woodpeckers Wreak Havoc On Gladstone Branch Poles: NJ Transit

NJ Transit is replacing the overhead wire poles along the Gladstone Branch with resilient steel poles between Gladstone and New Providence.

By Alexis Terrasi, Patch Staff | Feb 27, 2019 1:17 pm ET | Updated Feb 27, 2019 4:16 pm ET

Like 35 Share



SDG&E Wins Edison Electric Award for Wildfire Preparedness Efforts

POSTED BY TONI MCALLISTER ON JUNE 6, 2018 IN BUSINESS | 195 VIEWS | 0 COMMENTS | LEAVE A COMMENT

In high fire-risk areas, SDG&E replaced wood power poles with taller steel poles to improve fire resiliency. Workers also installed thicker power lines with increased spacing to avoid catching debris, as well as safety systems to halt power when falling lines are at risk of igniting material.

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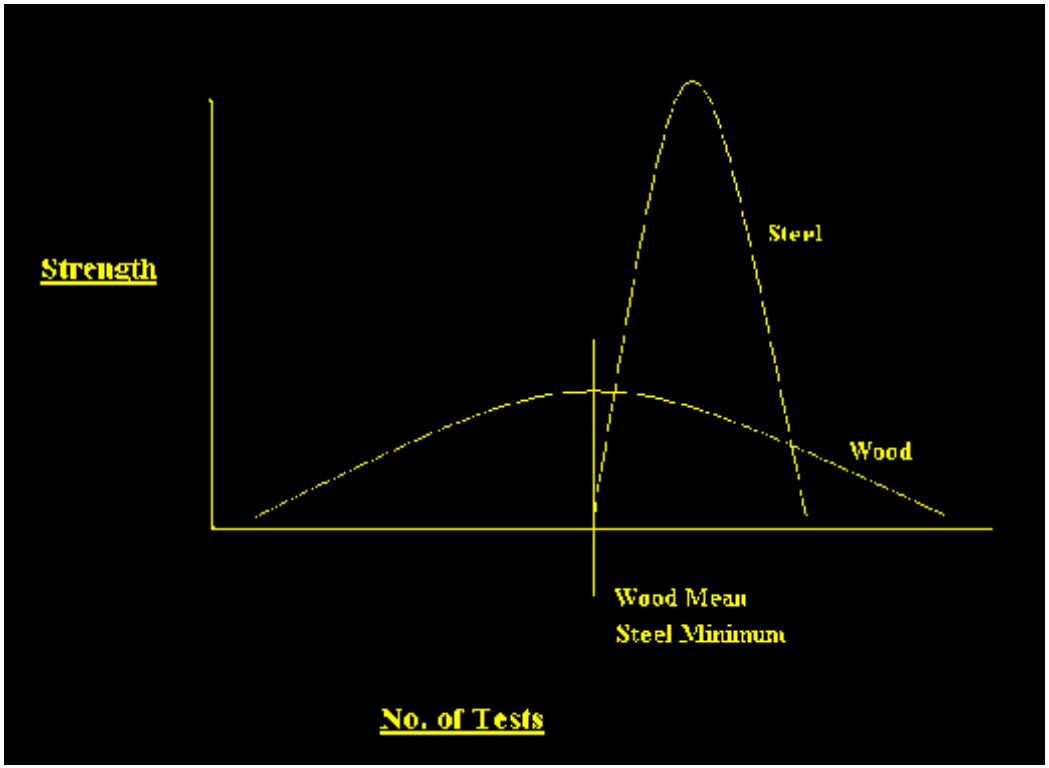
Engineered Product



Wood poles are designed to meet average mean strengths while steel is designed to meet minimum strengths

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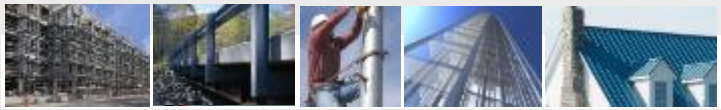

Marketing

Sustainability

What's That Smell from New Utility Poles?

Some Seattle City Light customers have noticed a strange odor coming from recently replaced wood utility poles in their neighborhoods. The source of the odor is the pole treatment compound Seattle City Light uses to protect against insects and decay and extend the useful life of the pole.

This treatment uses carrier oils (typically diesel fuel) to carry preservative chemicals into the wood

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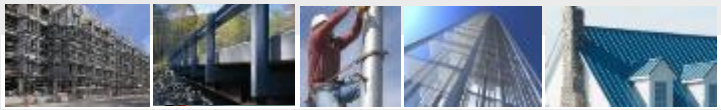


Marketing

ELECTRIC UTILITY OPERATIONS

Steel Poles Harden Distribution System

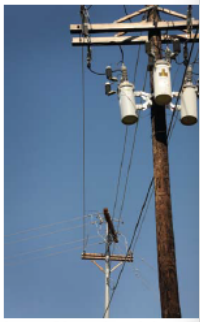
Bluebonnet Electric Cooperative crews inst steel poles to protect system against extrer environmental conditions.

By Thomas Ellis, Shawn Ely and David Tobola, *Bluebonnet Electric Cooperative*

Hurricane-force winds and frequent thunderstorms sometimes topple wood poles in Bluebonnet Electric Cooperative's service territory. When severe storms rage through the region, the environmental conditions often exceed the design specifications of Bluebonnet's electrical distribution system. When this occurs, the probability of poles failing increases significantly. In fact, in some cases, linemen have to replace multiple wood poles that have fallen in succession following a storm.

The non-profit rural utility is one of the largest power distribution cooperatives in Texas with more than 11,000 miles of power lines, more than 200,000 poles and 80,000 meters stretched across more than 3,800 sq miles in central and southeastern Texas. For the past 72 years, linemen have predominantly installed wood poles along the utility's vast network. Unfortunately, in areas of heavy woodpecker activity, some of these poles have lasted less than five years.

The utility knew it had to look to alternative pole materials to gain longevity, durability and economic value. A decade ago, the company began using steel poles to address areas where the company was experiencing structural damage due to woodpecker activity. Since that time, the company has expanded the use of steel to include structures that require extensive labor hours to replace such as difficult-to-access areas such as river crossings or primary riser poles.



Lineman usually have to replace wood poles every 30 but because of high woodpecker activity, they were re ing them every five years. For that reason, Bluebonnet ling steel poles in hard-to-a peckers.

Steel Poles Take Leading Role on Discovery Channel's "Dirty Jobs"

Wyoming's Carbon Power and Light Director of Operations David Cutbirth and crew were featured on the Discovery Channel's popular "Dirty Jobs" program. Steel distribution poles played a leading role.

DIRTY JOBS

The episode is a part of the show's series that focused on various types of work, highlighting a different vocation in every state in the U.S.

According to Cutbirth, the Discovery Channel contacted the Wyoming Rural Electric Association in search of a good place in Wyoming to work with utility linemen. Carbon Power and Light was selected for the shoot.

"We gave them two different scenarios," says Cutbirth. "The first one was cutting down trees to clear our right of way. Our forests are being ravaged by beetle kill right now and we're very concerned with a dead tree going down and starting a forest fire, that they didn't like that idea.

"The second idea was to switch out a wood distribution pole and replace it with a steel one. We outlined that we were going into a remote location, downgrading the line, changing the pole out from wood to steel, and then reenergizing the line. And this is what we went with."

Cutbirth says that the timing of the steel pole installation made what is typically a quick job into a very long day. "Normally it would take two to three hours to switch out the pole but for the timing it was a 10-hour job."

In the winter of 2009 an ice storm had split the wood pole and the pole had to be replaced. Cutbirth's crew was able to cut the top of the wood pole off in the middle of winter but had to wait until summer to take the pole out.

"We normally use a bucket but we couldn't get to this location with the bucket truck so we had to use the steps for this situation," says the veteran lineman. "This created a perfect "Dirty Jobs" scenario.

Cutbirth notes that although the "Dirty Jobs" show is about "dirty" work, he says that working as a lineman shouldn't be perceived as dirty work but instead a challenging profession. He adds that steel has helped make it cleaner rather than dirtier work.

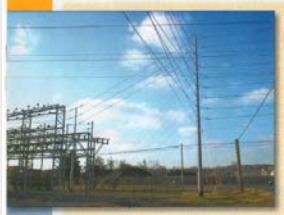
Carbon Power and Light Cutbirth take a break fro

"In my experience work splinters or treatments – lation to maintenance." sional says that the entire "Dirty Jobs" crew was ter really funny guy. I really importance of what we d

Contact David Cutbirth a or via email: dcutbirth@ca the Pole" video at http://dis working the pole.htm.

CONNECTIONS

STEELING FOR POLES



Contact: Dan Snyder, American Iron and Steel Institute, 202-452-7100, steel.org; or Clive Buttrey, Middle Tennessee Electric Membership Corporation, 615-404-1026.

American Iron and Steel Institute

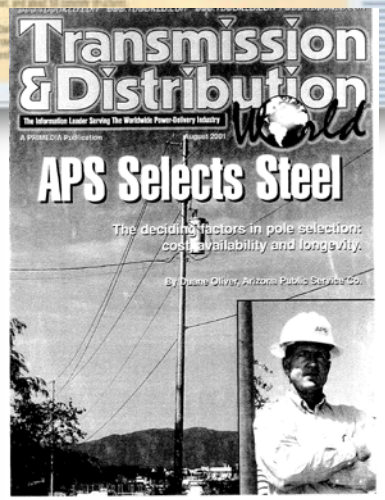
Lining Up With Steel

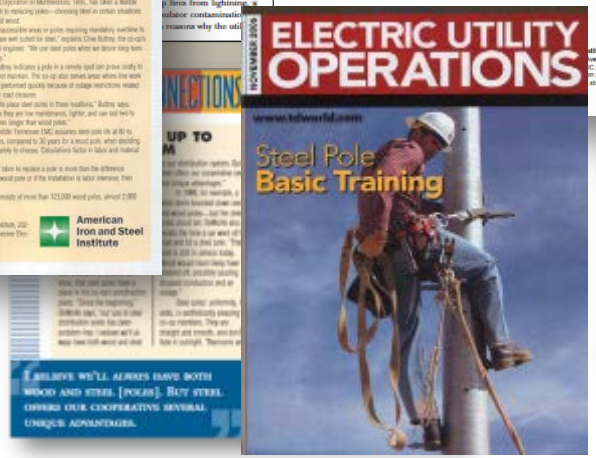
Tucson Electric Power evaluates the benefits of switching from wood to steel distribution poles.

By Roger Hall and Ron Runion, Tucson Electric Power

Comparing Pole Materials

34 September 2010 | www.tdworld.com





Approximately 100 media placements

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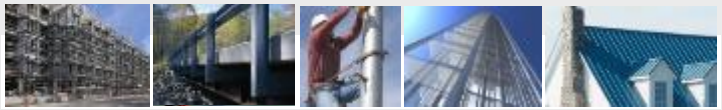
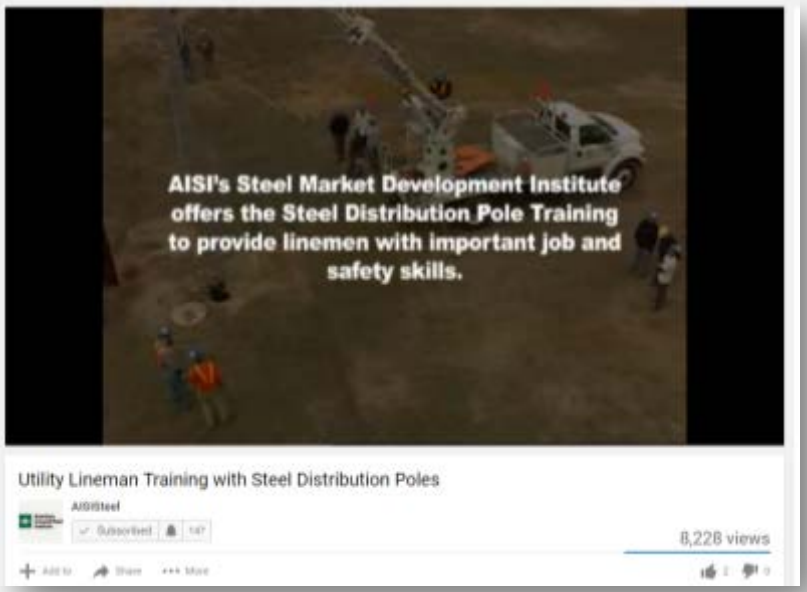
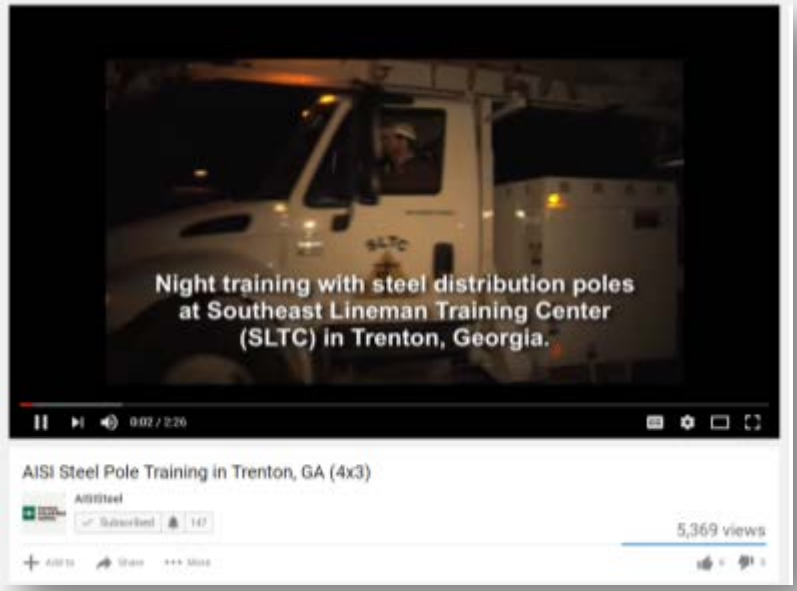


Marketing





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Marketing

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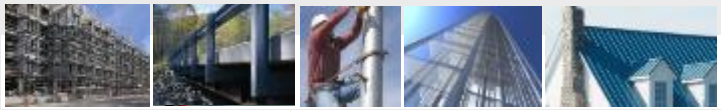
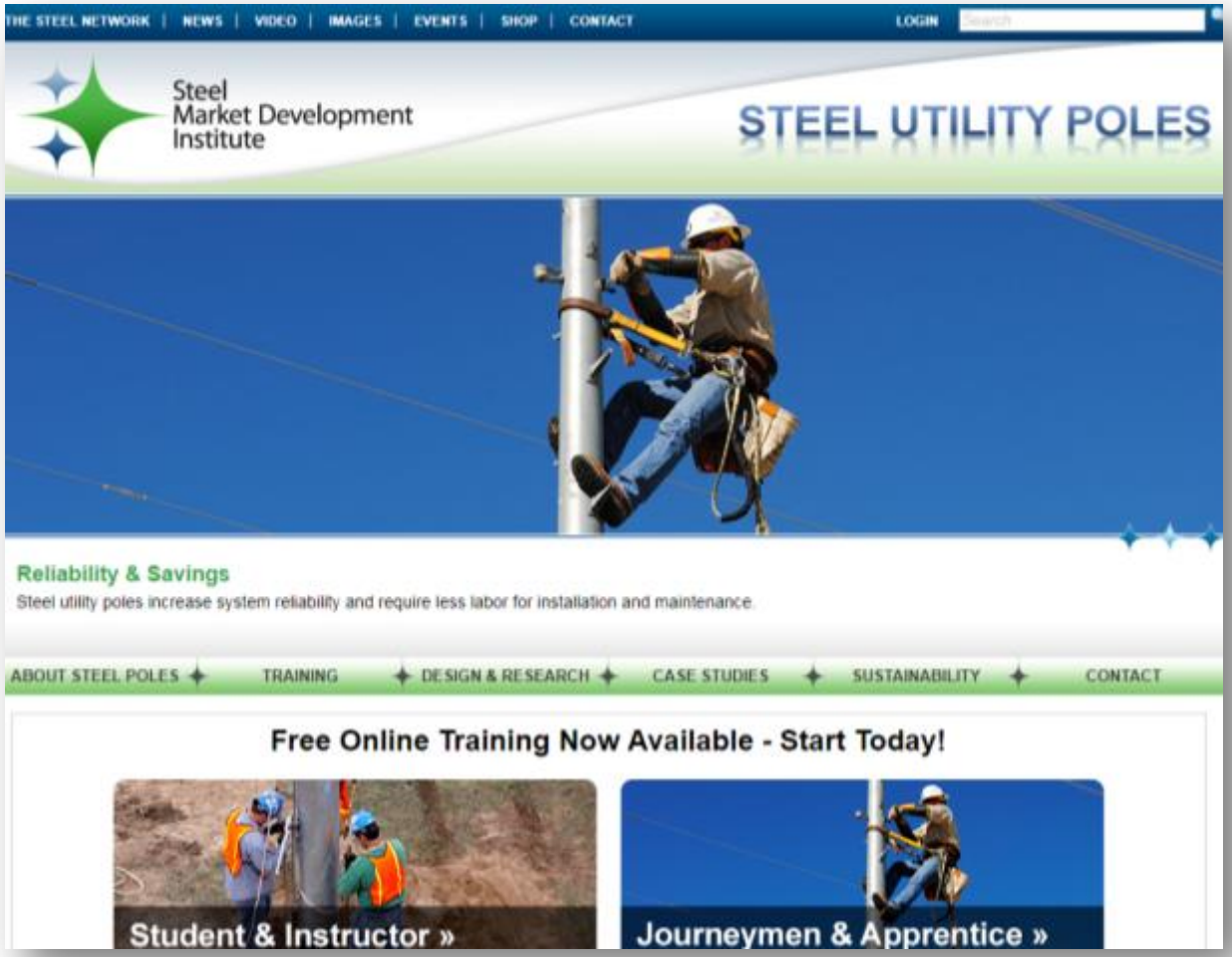


lineman.steel.org



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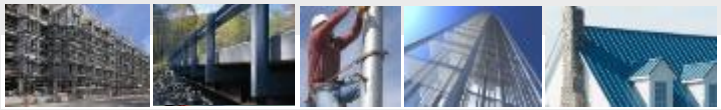
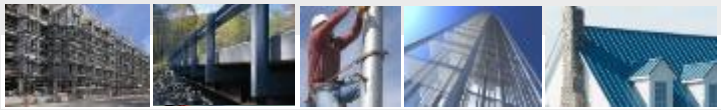


Research

- Grounding Equivalency of Steel Poles at MSU (1999)
- Placemaking Group (AVISO) Market Research (2000)
- Reliability of Steel Poles in NESC Grade C Construction (2001)
- Steel Utility Pole Corrosions Issues by Seymour Coburn (2001)
- AISI Overhead Distribution BIL Testing at NEETRAC (2002)
- Potential Telecom Market for Steel Distribution Poles (2003)
- Structural Reliability-Based Design of Utility Poles and the National Electrical Safety Code (2005)
- Longevity of Galvanized Steel Utility Poles by Tom Kinsler (2005)
- Steel Distribution Poles in Support of the Disaster Relief Effort by Outside Plan Consulting (2005)
- Revise Rule 094.B.7: Directly embedded steel poles shall constitute an acceptable electrode (2008)
- Pole Conductivity Testing by Gary McDonald (2010)
- Qualification of wood poles as electrical barriers in live work methods by EDM (2011)
- Total Cost of Ownership – proposal (2012)
- Environmental Life Cycle Assessment of Southern Yellow Pine Wood and North American Galvanized Steel Utility Distribution Poles (2013)



Challenges

First Cost

Culture

Resources

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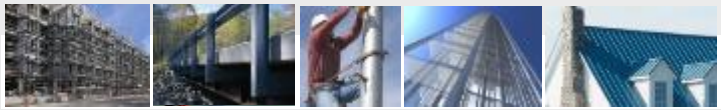
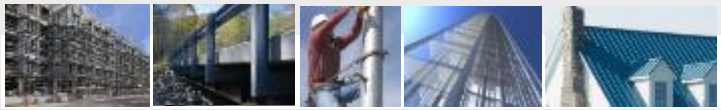


Why Now?

- **Every utility has an "issue" – we can "fix" them**
  - ✓ Engineering is no longer a significant "issue" – operations / education is
- **Reliability is of growing importance**
  - ✓ Wind, fire, and ice storms (and woodpeckers/bears) change minds quickly
- **Sustainability is now significant**
  - ✓ United Nations is leading the charge
- **Distribution spending is on the rise**
  - ✓ Transmission spending is on the decline
- **Lineman culture is changing**
  - ✓ "Not a big deal…."
  - ✓ Large turnover in industry (average age near 50)
- **Opportunities exist, need more resources**
  - ✓ Must invest in "people"



Summary

- Low risk market development opportunity with big potential
- Product has inherent strengths & history
- Research/Engineering is done
  - Need strong marketing / educational effort
- Challenge is to offset first cost
- **Shared goals/investment and power of joint effort**

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