

Beneficial Electrification

Keith Dennis

Senior Director, Strategic Initiatives
National Rural Electric Cooperative Association
(NRECA)



Beneficial Electrification Opportunity



- Many stakeholders believe that Beneficial Electrification (BE) is key to meeting US and global GHG reduction goals – and it's a **pro-growth strategy!**
 - Emissions of generation are declining
 - Efficiency of devices is increasing
 - More flexible loads are desirable
- BE may lead to scenarios where more electricity is used, but fewer overall GHG emissions are produced

Introduction: What is “Beneficial Electrification?”

Regulatory Assistance Project:

“For electrification to be beneficial, it must satisfy at least one of the three following conditions, without adversely affecting the other two:

- 1 Saves consumers money over the long run;*
- 2 Enables better grid management; and*
- 3 Reduces negative environmental impacts.*

Growing Consensus for BE

Lawrence Berkeley National Lab finds:

The key to meeting GHG goals is “*widespread electrification of passenger vehicles, building heating, and industry heating.*”

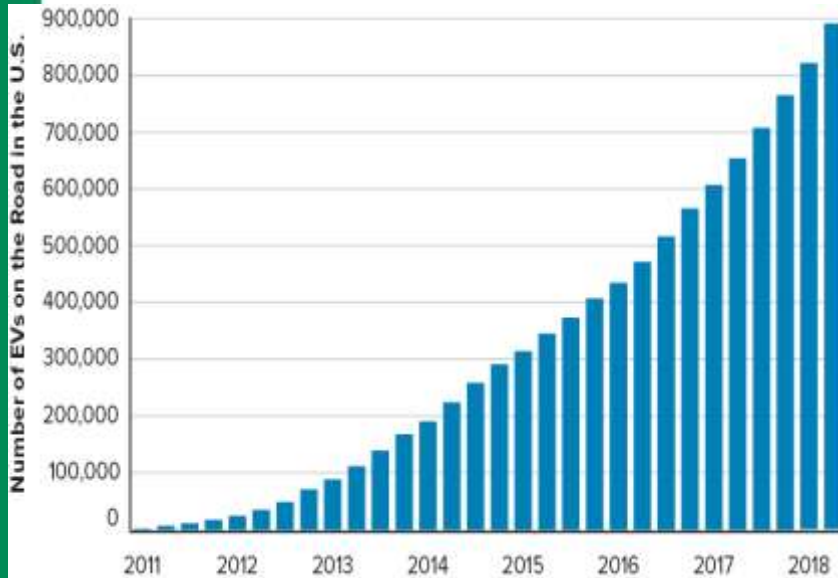
- United Nations, E3, Acadia Center, Stanford and Columbia Universities, California Pathways Project, DOE’s QER, Bill Nye the Science Guy and many more are all adding to the chorus.
- ***Consensus on benefits of renewed electrification***



EV market is growing! Customer benefits as well

Almost 900,000 EVs are on the road today in the U.S. About 1.5% of new car sales.

EVs charge at \$1.20 per gallon



Some fun: What Will Your Grandkids Think?

<https://youtu.be/vog7yDmcDNQ>

Grandpa's loud old lawnmower that requires a smelly can of gas and oily parts and shoots out smoke vs an electric version...

The answer may have nothing to do with GHGs...

Industry Is Moving – NRECA as Well



Home Events Library Jobs Viewpoints Topics ▾

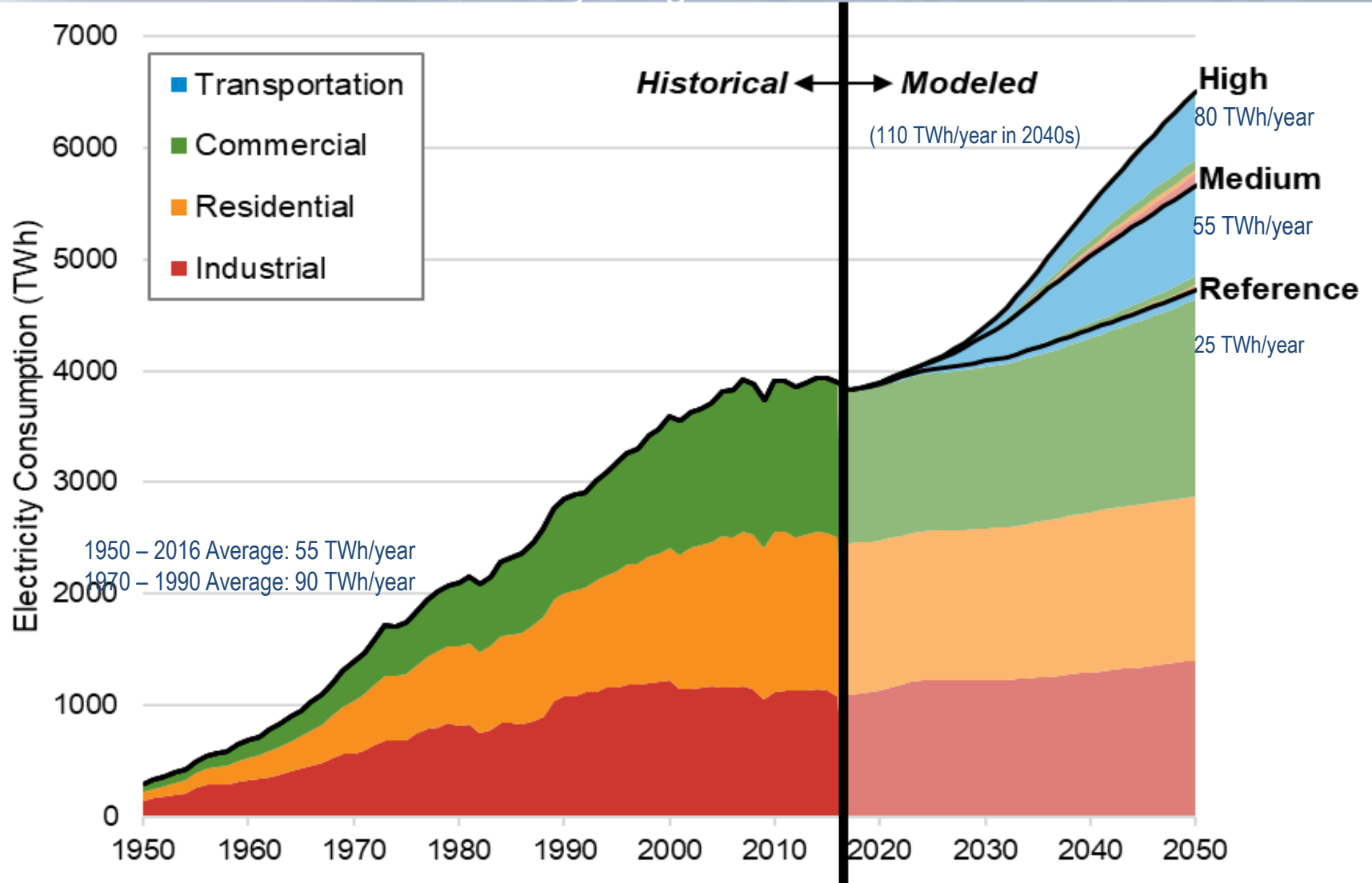
FEATURE

Brattle: Wider electrification key to averting both climate change and utility death spiral

Tapping new power demand from EVs and heating can help the industry thrive as it pushes toward deep decarbonization

- NRECA Proposed Resolution: “Promoting the Benefits of Electrification”
- EPRI: \$30 M for “Efficient Electrification”

Dramatic increase in demand led by transportation; unprecedented 80-110 TWh/year growth rates



Electric Technology Has Changed - Electric Agricultural Pumps and Heat Pumps



Great opportunity to incentivize electric agricultural pumps and heat pumps for space heating in rural areas!!!

Better Product Quality in Many Industries



Image: Electric rock crushing using electricity in Illinois (Coles-Moultrie) increases co-op load, improves operation, and reduces air pollution

Down The Road – More Electric Tractors and Broadband/Technology Enabled Water Management

John Deere unveils latest all-electric tractor prototype for zero-emission agriculture

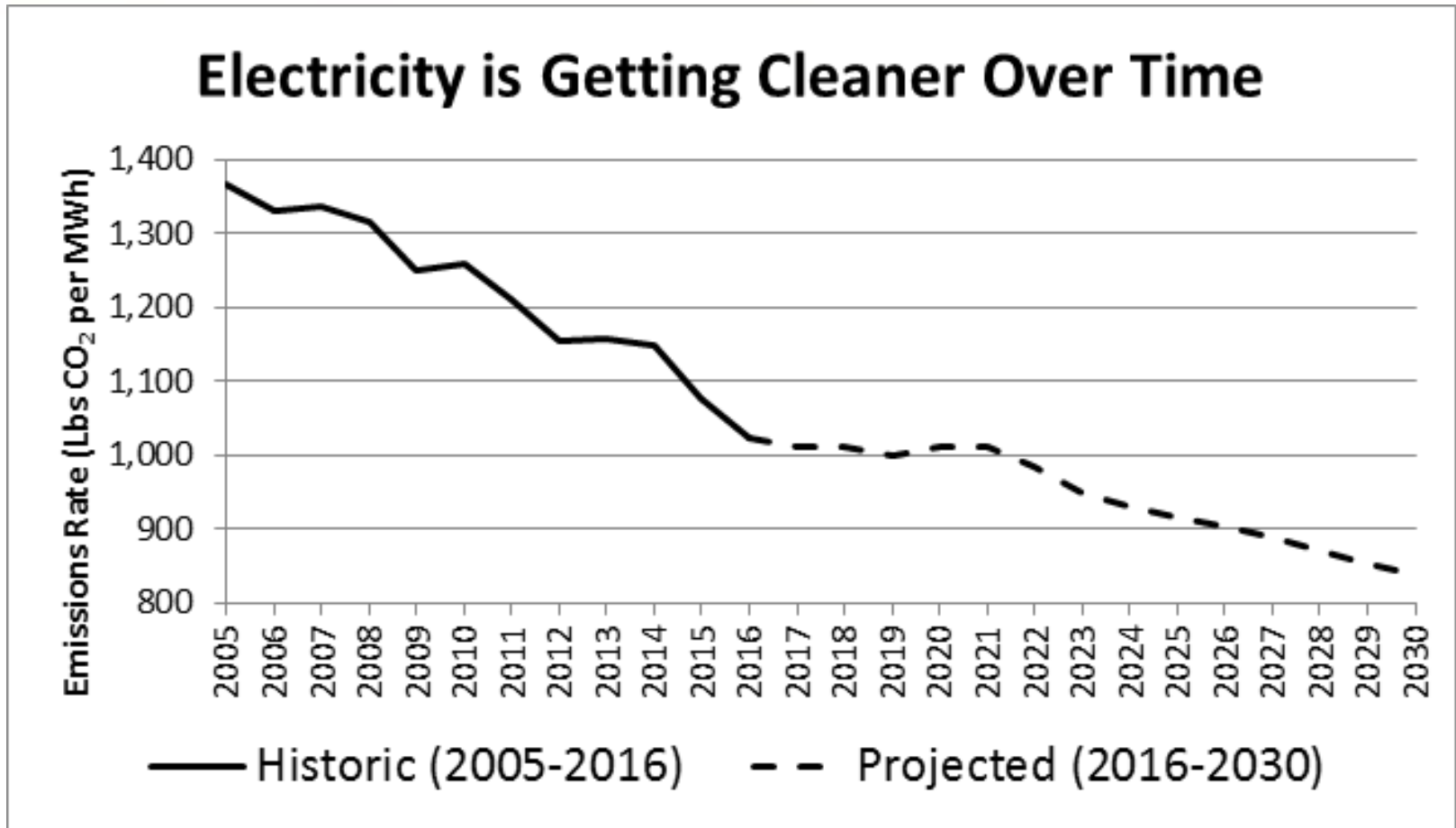
Fred Lambert - Dec. 5th 2016 5:30 am ET [@FredericLambert](#)

ELECTRIC TRACTOR

JOHN DEERE



Opportunity for “EBE” to Improve “Emissions Efficiency”

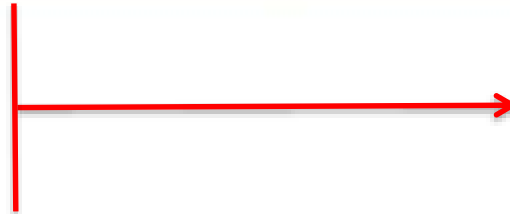


While the energy efficiency of devices will not change once installed, the **emissions efficiency** (or “**emiciency**”) will improve over time

Example: Piedmont EV Consumer-Cost Savings

Super Off Peak Rate: 2.79 cents

On-Peak Rate: 26 – 34 cents



Rates that allow co-ops to recover costs and achieve desired night load

Electric Car: Annual car charging costs as low as \$129 for consumers or as high as ~\$1,200



Co-op has a new consumer load, consumer has ability to manage costs

Gas Car: Annual gas consumption for regular gasoline car \$1,154



Co-op has no new load, consumer has no control over gas cost



Ford Focus gas vs. electric



Example: Great River Energy EVs



GRE promotes Electric Vehicles by providing free wind energy upgrade and \$500 electric charger rebate.

GRE has sought night load for decades to increase revenue and recover costs

- Kept coal power plants running in decades prior
- Makes use of cheap wind now, helping the bottom line

Example: Steele-Waseca Water Heaters and Solar



Buy a 410 watt panel in the SUNNA project and get a free electric thermal storage water heater

- ▶ \$170 panel cost to consumer
- ▶ No sighting issues
- ▶ No maintenance issues
- ▶ Hedge against future energy hikes



Example: Steele-Waseca Water Heaters and Solar



Steele-Waseca Cooperative Electric offers sweet community solar and water heater bundle

Steele-Waseca Electric Cooperative Announces New Community Solar Model with Off-Peak Water Heating

JANUARY 13, 2015

Small Co-op,
Big Idea



Why one electric co-op is offering their solar customers free water heaters

In Steele-Waseca's territory in Minnesota, community solar comes with a "catch."

By [Robert Walton](#) | February 10, 2015 print

Example – Dakota Electric School Bus



America's schools spend roughly \$2 billion on fuel each year for transportation.

Transitioning to electric-powered school buses could cut these costs *in half*, down to \$1 billion.



Beneficial Electrification C&I Case Studies

- NRECA has developed a series of case studies highlighting examples of C&I beneficial electrification projects
- Projects lead to benefits that include member service, improved process efficiency and consumer cost savings

Electrification Activity to be Highlighted
Rock Crushing
Cooking Equipment / Commercial Kitchens
Gas Pipeline Compressors
School and Service Shop Heating
Irrigation Systems
Fork Lifts

Further Contact Information

Keith Dennis

Senior Director, Strategic Initiatives
Business and Technology Strategies

NRECA

(703) 907-5787

Keith.Dennis@nreca.coop