

17 October 2019

Energy Efficiency, Decarbonization, and Electrification

ACEEE Energy Efficiency as a Resource
Minneapolis, MN

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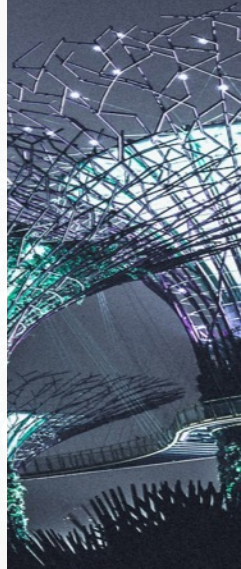
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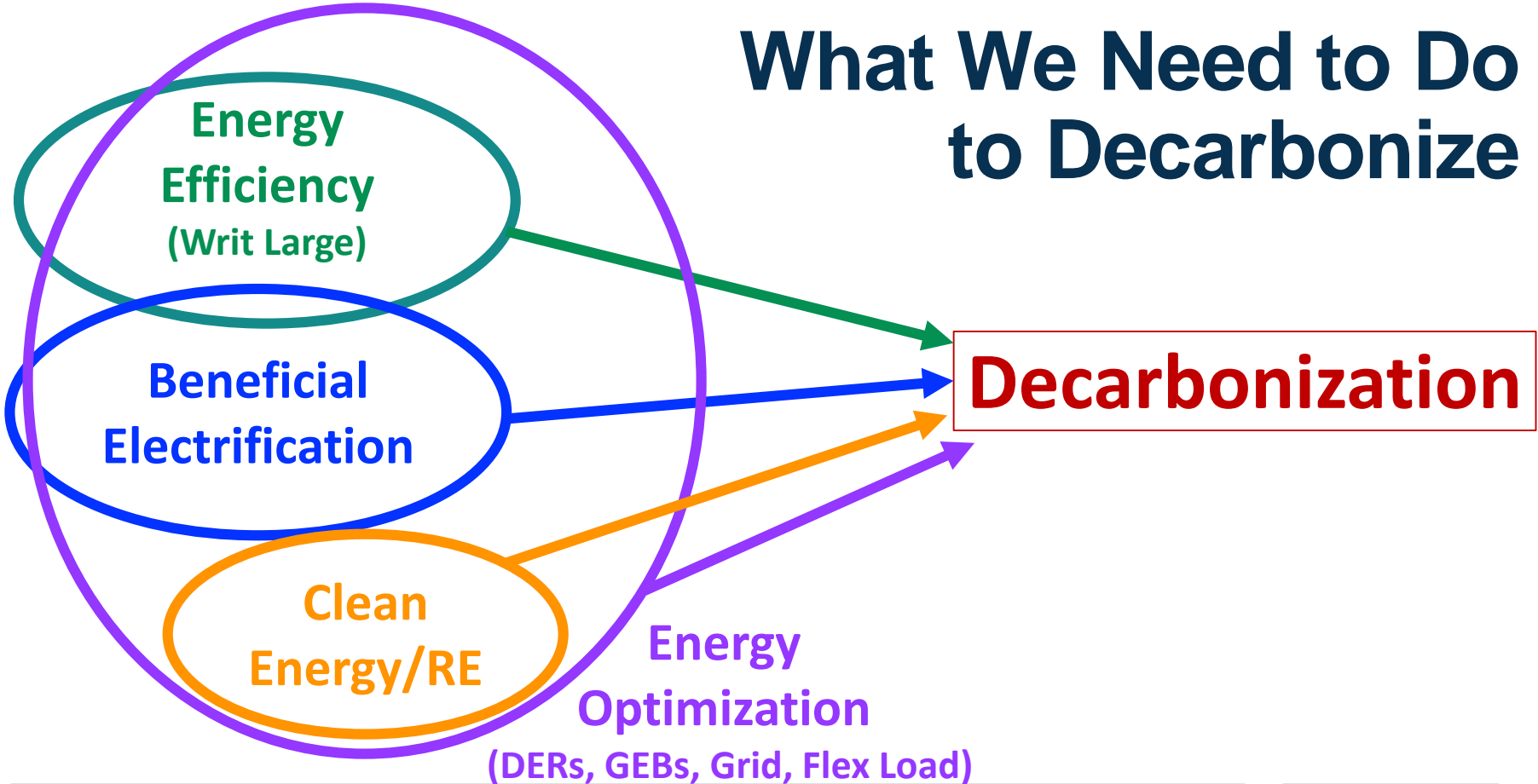
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Our Defining Issue: Decarbonization

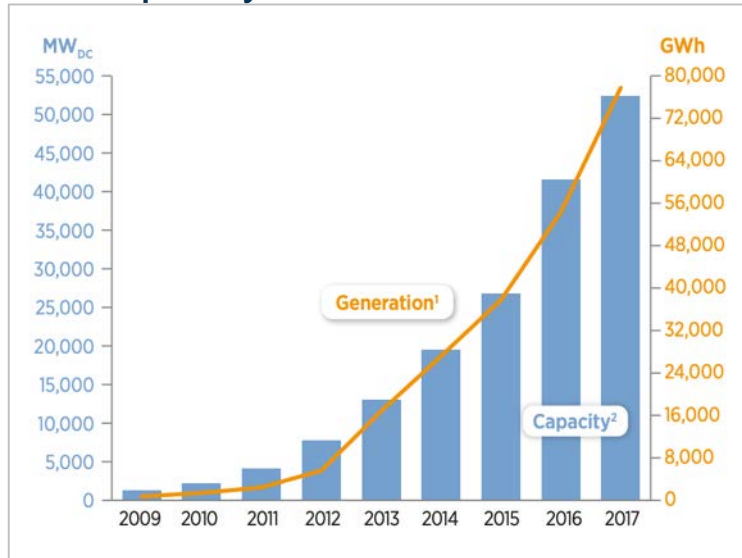


What We Need to Do to Decarbonize

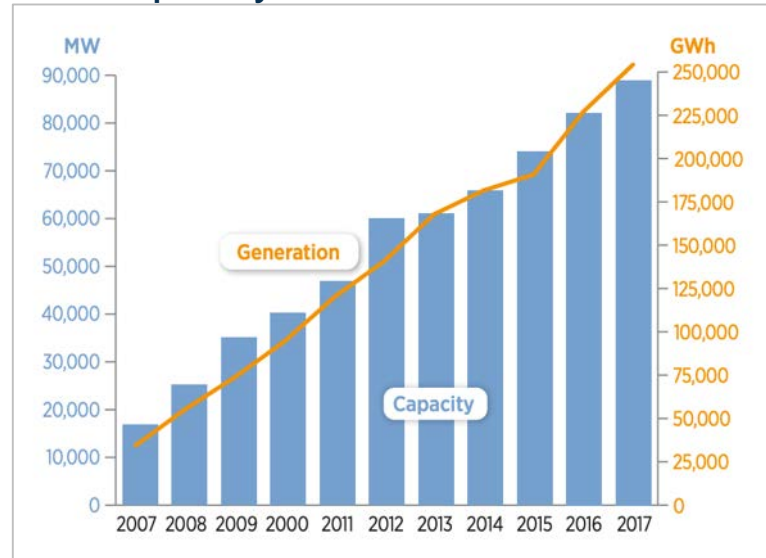


RE: Growth in Market-Based Grid Resources

US PV Electricity Installed Capacity and Generation

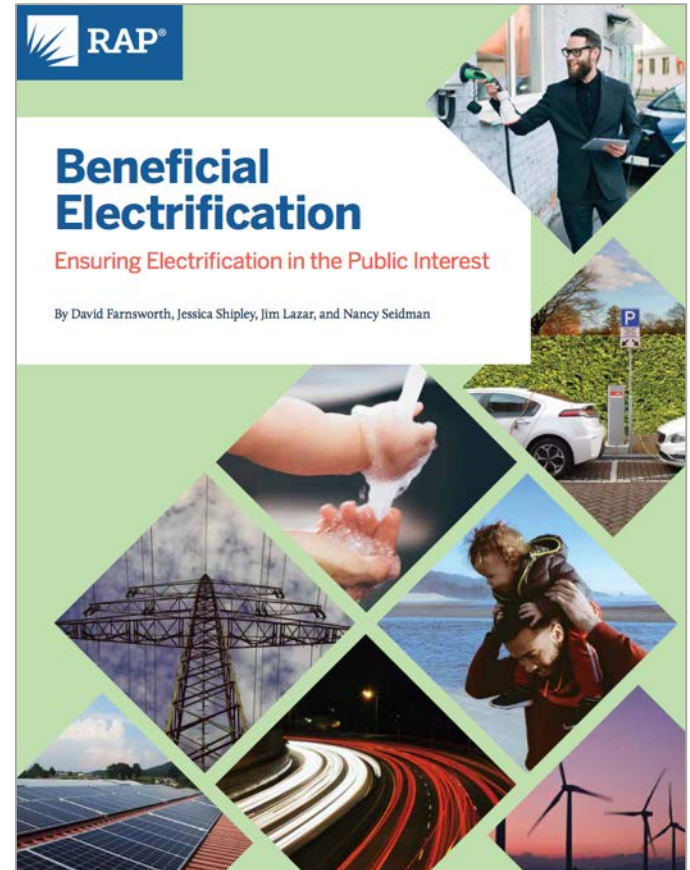


US Wind Electricity Installed Capacity and Generation



Beneficial Electrification: Ensuring Electrification in the Public Interest

- 6 principles to ensure beneficial to consumers, environment, grid
- Papers for EVs, water heating, and space heating

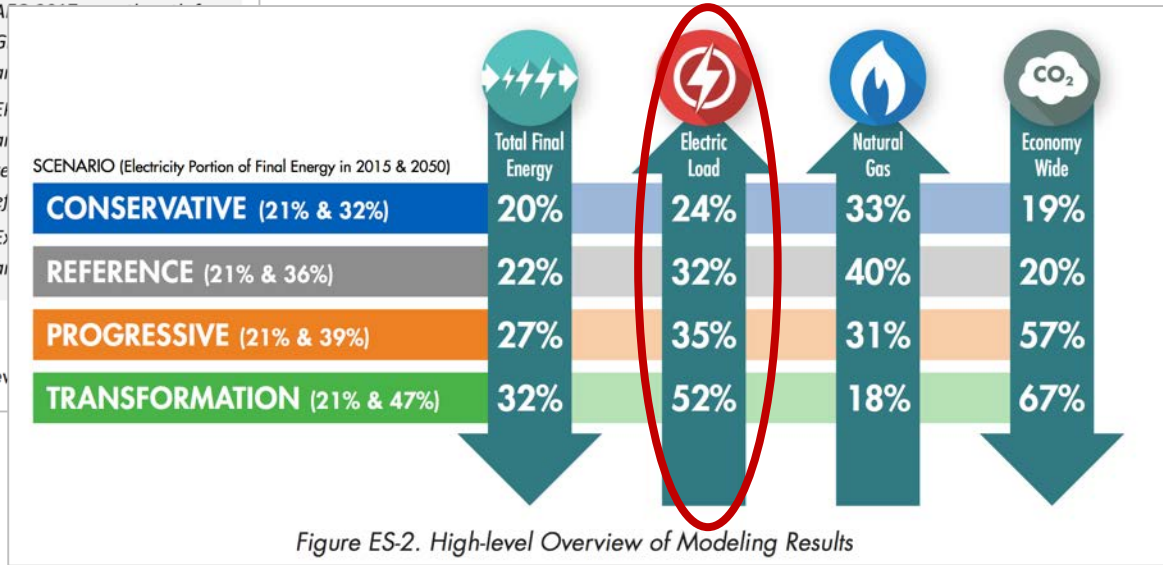


<https://www.raponline.org/BE>

EPRI's 2018 US National Electrification Assessment

CONSERVATIVE	<i>Slower Technology Change</i>	• A G a a
REFERENCE	<i>Reference Technology</i>	• E a te ef • E a a
PROGRESSIVE	<i>Reference Technology + Moderate Carbon Price</i>	
TRANSFORMATION	<i>Reference Technology + Stringent Carbon Price</i>	

Figure ES-1. Study Scenario Overview



Electrification Will Boost Load Flexibility

	Generation capacity avoidance	Reduced peak energy costs	System peak related T&D deferral
Direct load control	X	X	X
Interruptible tariff	X	X	X
Demand bidding	X	X	X
Time-of-use (TOU) rates	X	X	X

Source: Brattle, 2019. https://brattlefiles.blob.core.windows.net/files/16639_national_potential_for_load_flexibility_-_final.pdf

New EE Technologies Will Emerge: Ultrasonic Clothes Drying

- Sound waves “shake” moisture out of clothes
- 80% reduction in electricity



DRYMAX



New Drying Solutions for 2018

Rice, Barley, Soybean, Wheat, Other Seeds

New Drying Solutions for 2019

Alfalfa

Manure

Hemp!

Begasse, Wood Pulp, Other Biomass

Food Processing

Municipal Drying - Sludge

80-92%
Less energy

Standard &
Poor's Utility
Practice:
*“Expect little
net load
growth going
forward.”*

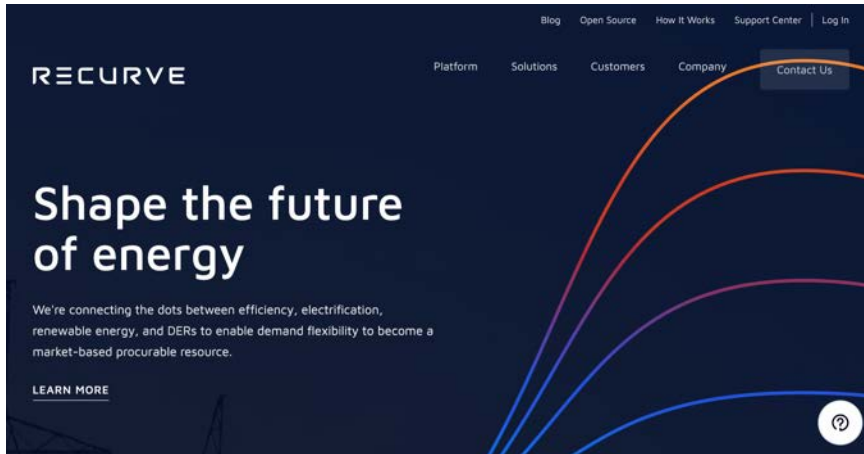
Today's EE/DSM "Eddy"



- Capacity Resources
- Renewables & DERs
- Fossil Resources
- Ancillary Services
- Utility EE/DSM

Markets: DERs & “Metered EE”

- “Law of Big Numbers” can make EE *work like any other DER*
- Now can **value** (and **compensate**) EE’s grid benefits, flexibility, non-energy benefits, etc.



Need to Re-Imagine Today's Energy Efficiency

- Revise state **EERS** to avoid kWh-consumption limits (BE decreases total energy use, but increases kWh)
- Remove **fuel-switching** prohibitions for BE
- Remove **load-building** prohibitions for BE
- Enable “**EE as a DER**” using analytics, so it can be a genuine market resource

Good News from EPA for EE:

“Enforceable requirements are one reasonable basis for projecting a change in operating parameters and thus emissions; energy efficiency, renewable energy, or other such programs where there is a documented commitment to participate and a verifiable basis for quantifying any change in future emissions due to operational changes may be another.”

-- USEPA OAQPS, “*Guidance on Regional Haze State Implementation Plans for the Second Implementation Period*,” August 20, 2019



<https://www.epa.gov/statelocalenergy/estimating-health-benefits-kilowatt-hour-energy-efficiency-and-renewable-energy>

***“We must use less electricity
where we can,
so we can use more
where we should.”***

-- Former EPRI CEO Steve Specker

About RAP

The Regulatory Assistance Project (RAP)[®] is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org



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