Webinar

Market for Renewables: The emerging case for businesses in Texas

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Introduction

Moderator: Elisa Wood

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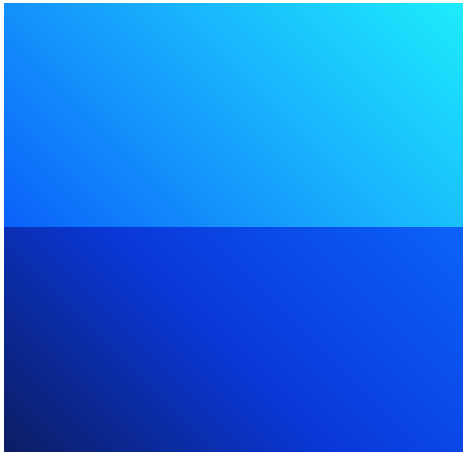

Renewable energy in Texas has evolved

Commercial and industrial customers contracted for more renewable megawatts in 2018 than ever before.

- Texas has 24,629 MW of installed wind capacity as of 4th quarter 2018
- Wind capacity generated over 22% of the Lone Star state's power as Q2 in 2019

- Texas is ranked third nationally when it comes to projected solar growth
- Over the next five years, Texas expects to add over 5 GW to the 1.8 GW now installed
- Since 2010, the cost to install solar has dropped by more than 70%

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Webinar contents

- How Texas became a renewable energy leader
- Historic events for the Texas market in summer 2019
- Influence of renewables on wholesale markets
- The silver lining for businesses
- Renewable Select: a way to simplify the complexity

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Today’s panelists

Bill Barnes
Director of Regulatory Affairs at NRG

Steven Batchelder
Managing Director, Origination at NRG

Bradford Pete-Hill
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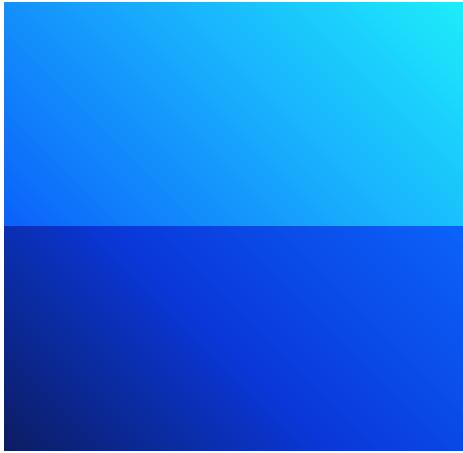
Why has renewable energy grown so much?

Bill Barnes



The renewable energy revolution

Tax incentives

Favorable government policies

Households

Businesses

Institutions

Communities

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Why has renewable energy grown so much in Texas?

2/3 of electricity consumers in the U.S. are served by competitive power markets.

Texas is among 13 states and the District of Columbia that allow retail choice.

Texas encouraged wind development by creating competitive renewable energy zones (CREZ).

- The CREZs incentivized construction of transmission lines.
- The policy encouraged **3,600 miles** of transmission lines that now allow the flow of **18,000 MW** of primarily wind generation.

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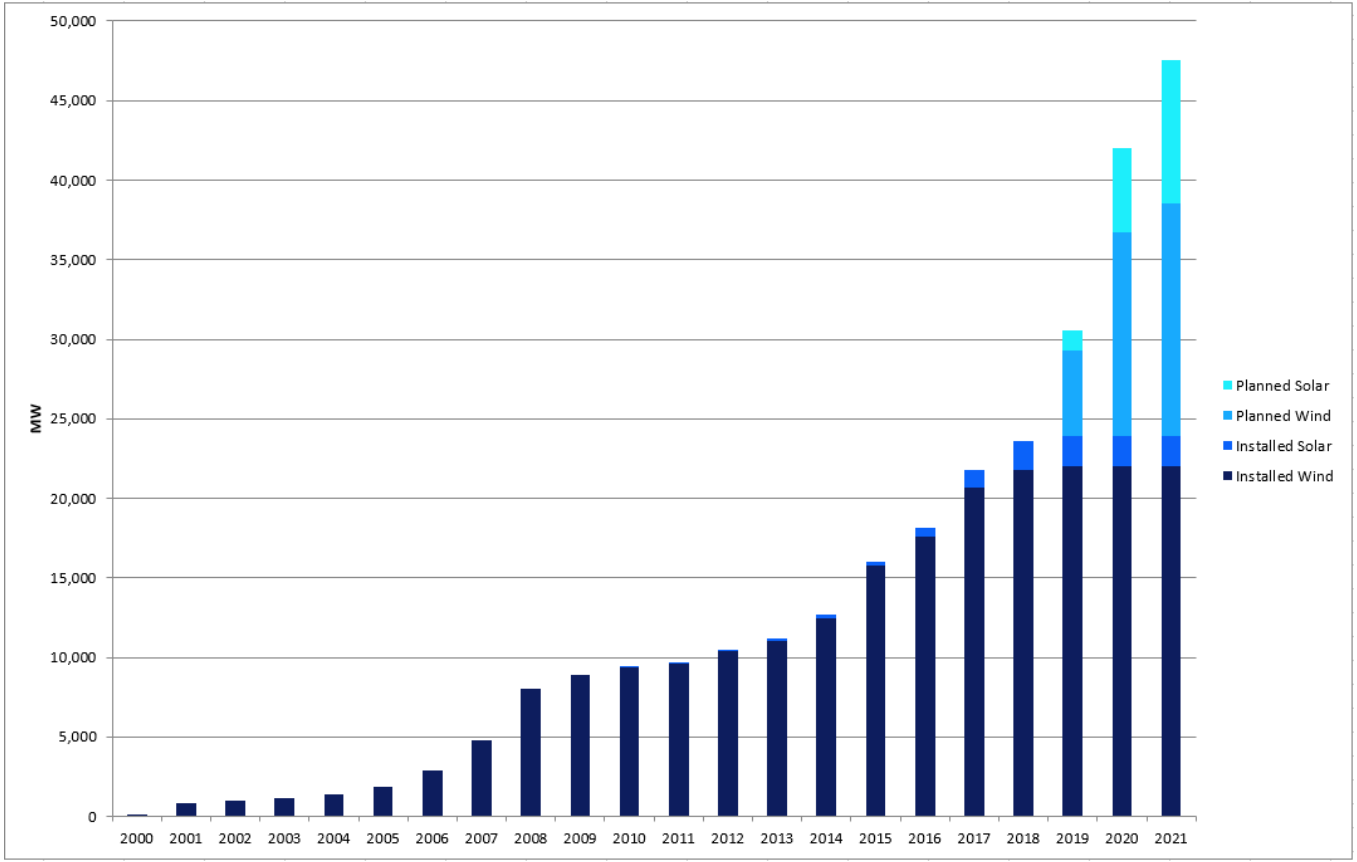
Growth of renewables in ERCOT



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Data Source: ERCOT Generation Interconnection Queue Update for August 2019.

What does the growth in renewables mean for the energy customer in ERCOT?

Next 5 years

Fewer conventional power plants

More renewables

This is likely to create a tighter market and greater price volatility.

Texas will build more renewable energy

Solar expected to grow significantly.

Battery technology will improve

And as it becomes less expensive, it can help balance disparities on a greater scale.

A renewable MW is ≠ to thermal MW

1 MW of thermal

=

.15 MW of Non-Coastal Wind

.58 MW of Coastal Wind

.74 MW of Solar

* ERCOT Summer Peak Load Renewable Capacity Contributions

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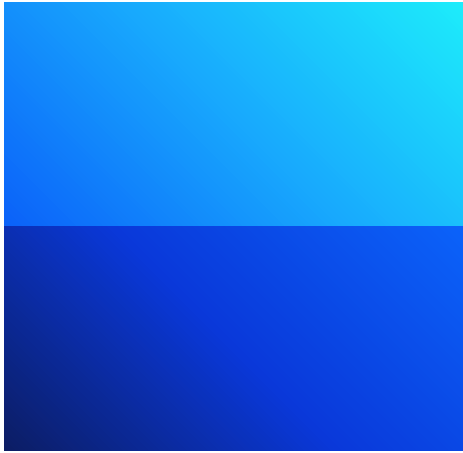
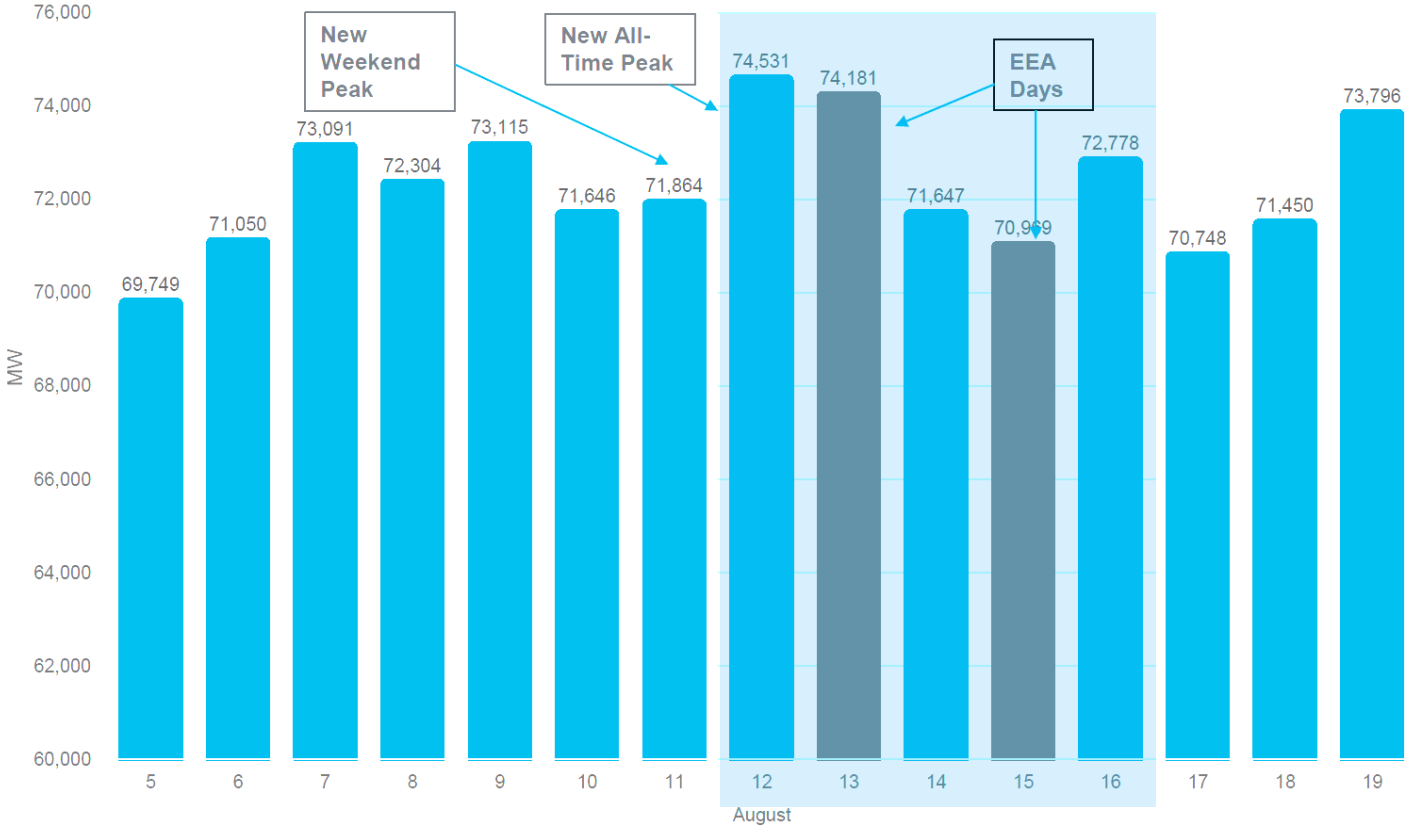
Summer 2019

Bill Barnes



Record Loads in ERCOT



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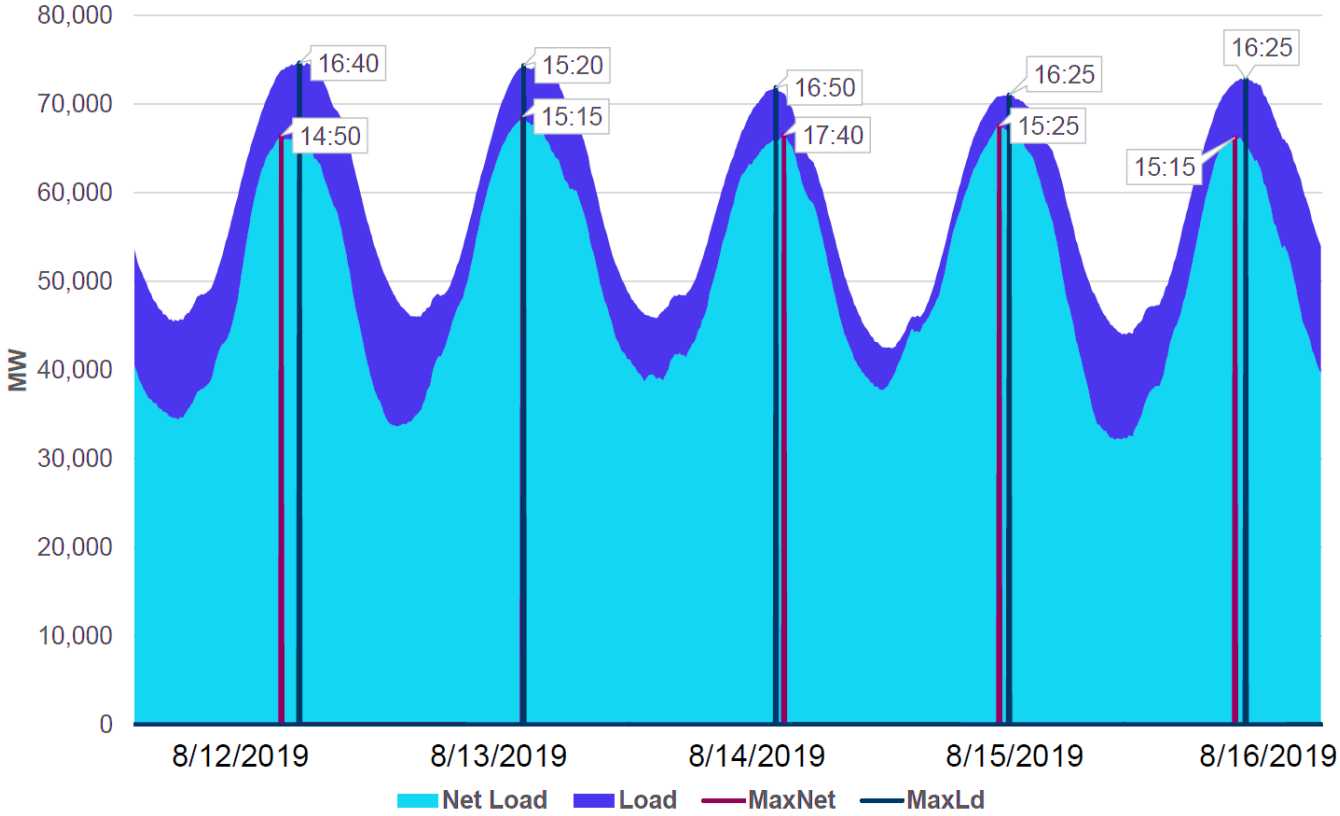
Data Source: ERCOT`S AUGUST 2019 PRELIMINARY REVIEW OF ERCOT OPERATIONS PRESENTATION AT THE AUGUST 29, 2019 PUCT OPEN MEETING.

Net Loads in ERCOT



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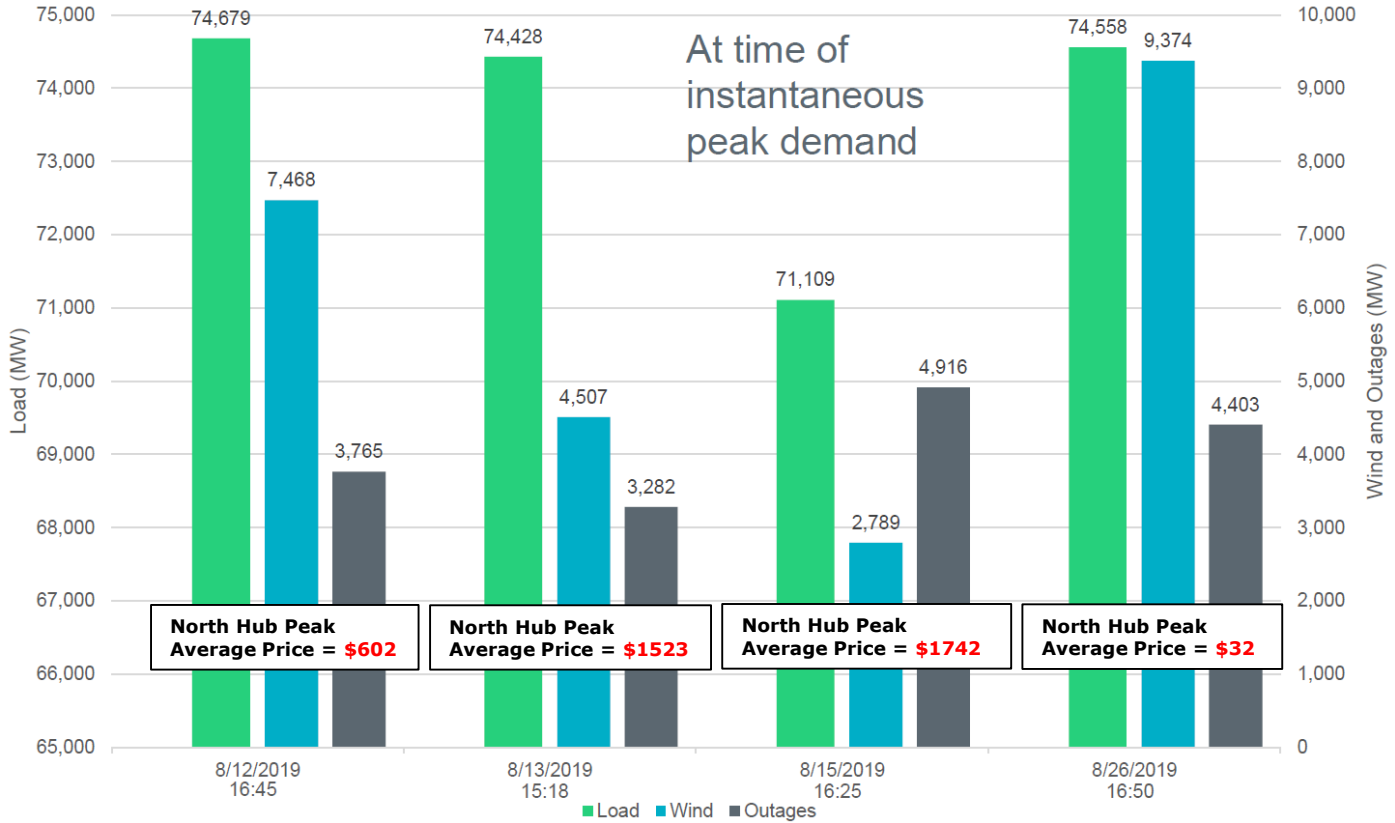
Renewable Variability Equals Price Volatility



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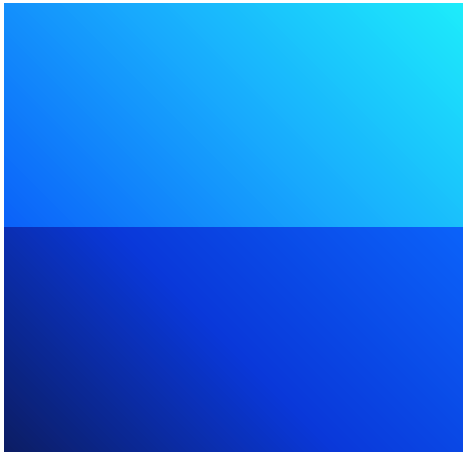
Influence of renewables on wholesale markets

Steven Batchelder



Renewables benefit ERCOT, but …

Renewable output is variable which increases the uncertainty of power supply and creates price volatility within ERCOT.

Electricity is particularly vulnerable to price volatility because, unlike other commodities, it cannot currently be stored in meaningful quantities.

The Operating Reserve Demand Curve (ORDC)

The ORDC is a market mechanism that establishes "scarcity" prices.

ORDC

The ORDC automatically increases the price of power as reserves get tighter.

ORDC Adder

The ORDC adder activates when operating reserves decrease below 6,000 MW and continue to decline, with the maximum price adder applied when reserves drop to 2,000 MW.

The price adder reflects the "value of lost load" — the estimated average economic impact to electricity customers if firm load is shed.

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How high can prices go?

$30-45/MWh

average power price range over the last several summers (2014-2018)

$149/MWh

average power price range over the summer 2019 time period

When the ORDC activates, prices can rise to a cap of

$9,000/MWh

ORDC is designed to set power prices at a point that establishes economic incentives for generators to maximize supply and consumers to reduce demand.

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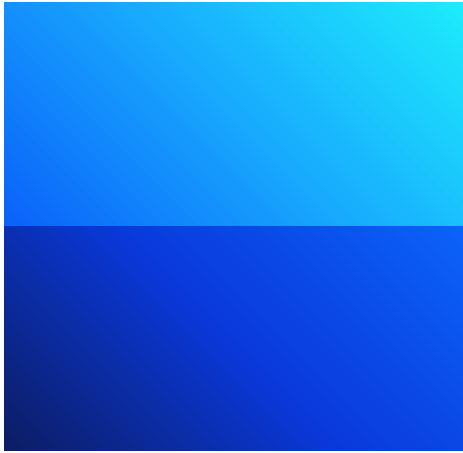
Renewable energy contract for businesses

Bradford Pete-Hill



Smaller businesses see the advantage of renewables

Smaller businesses can now procure competitively priced renewable products

65% of small businesses & **73%** of medium businesses intend to purchase renewable energy within five years

Among all size businesses, about **77%** have procured or are interested in procuring renewable energy in the future

Source: NRG survey of businesses in deregulated markets

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How can businesses take advantage of this emerging opportunity to go green?

NRG offers a straightforward retail supply contract.

Renewable Select — no large commitments required.

FEATURES	RENEWABLE SELECT	OFF-SITE RENEWABLE	ON-SITE SOLAR	REC PURCHASES
Low-cost pricing	✓	✓		
Renewable Energy Credits	✓	✓	✓	✓
Promotion/marketing	✓	✓	✓	✓
Additionality claim	✓	✓	✓	
Pointing rights	✓	✓	✓	
Project tours	✓	✓	✓	
No building modifications	✓	✓		
Simplified retail contract	✓			

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Product offerings

Fixed Price

Offers predictability and simplicity of a set price/MWh for the contract duration.

Percent Fixed & Index (PF&I)

Creates the ability to control exposure to index markets by purchasing fixed-price blocks that follow load shape with the remaining quantity at index prices.

Block & Index (B&I)

Provides sophisticated customers exposure to the wholesale market by purchasing blocks suited to their risk and load profile. Consumption above or below block volumes is settled at index prices.

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Questions?

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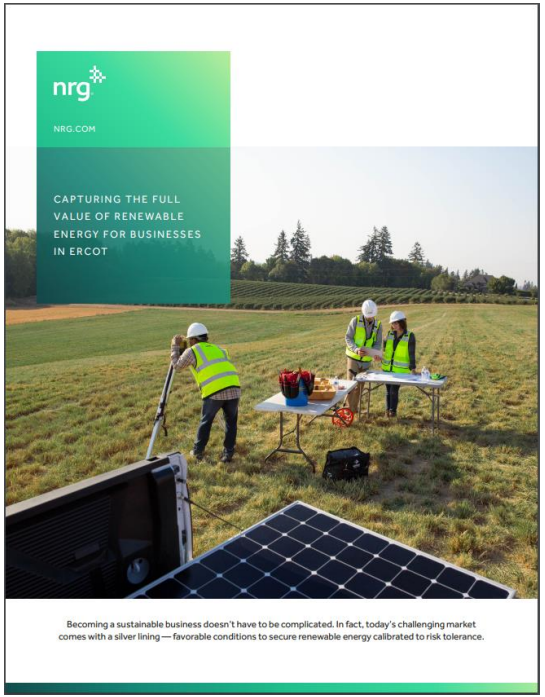

Renewables in ERCOT White Paper

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