



# Renewables Procurement: Creating New Ways to Raise Sustainability

June 24<sup>th</sup>





LET'S GO BEYOND™

Our Mission:  
Reducing the Energy Intensity of the World

Our Goal:  
Reducing Customer Carbon Footprint by 1 Billion metric tons of CO<sub>2</sub> by 2030

# Trane/IR Commitment and Accomplishments



Trane and the Ingersoll Rand companies have an aggressive climate plan:

## 2020 Climate Commitment: 2013-2018 Progress

Ingersoll Rand is helping to solve some of the world's most pressing challenges – including the unsustainable demand for energy resources and impact on greenhouse gas emissions.

<p style="font-size: 2em; color: red;"><b>50%</b></p> <p style="font-size: small;">Reduction in the greenhouse gas refrigerant footprint of our products by 2020, and incorporating alternatives with lower GWP across the company's product portfolio by 2030.</p>	<p style="font-size: 2em; color: red;"><b>35%</b></p> <p style="font-size: small;">Reduction in greenhouse gas footprint of our own operations by 2020.</p>	<p style="font-size: 2em; color: red;"><b>\$500M</b></p> <p style="font-size: small;">Investment in product-related research and development by 2020 to fund the long-term reduction of GHG emissions.</p>
<p style="font-size: 2em; color: green;"><b>-53%</b></p> <p style="font-size: small;">Next gen refrigerants; reduced leak rates; increased product efficiencies</p>	<p style="font-size: 2em; color: green;"><b>-45%</b></p> <p style="font-size: small;">Refrigerant transition and management; lighting and HVAC improvements</p>	<p style="font-size: 2em; color: green;"><b>~\$400M</b></p> <p style="font-size: small;">Next gen refrigerant development; refrigerant testing</p>

## Advancing Our Climate Commitment

### Achieving Our Commitment

INCREASED ENERGY EFFICIENCY BY **10%**

WE HAVE REDUCED

**ENERGY USE BY**

**109,000**

MM BTUs

&

**ELECTRICITY CONSUMPTION BY**

**22,000**

MWh

---

THE EQUIVALENT OF

Not Burning  
**26 MILLION LBS OF COAL**

OR

Powering  
**1,750 HOMES FOR 1 YEAR**

### Extending Our Commitment

WE HAVE

SOLAR ENERGY USE

AT MANUFACTURING FACILITIES IN:

TRENTON, NJ  
COLUMBIA, SC

TAICANG, CHINA

---

THE EQUIVALENT OF

Saving  
**560,000 GAL OF GASOLINE**

OR

Taking  
**1,000 CARS OFF THE ROAD**

WE HAVE SIGNED A POWER PURCHASE AGREEMENT FOR

**100,000**

MEGAWATT HOURS

per year

---

REPRESENTING

**32%** OF OUR U.S. ELECTRICITY CONSUMPTION

# The Most Sustainable Unit of Energy?



The one you don't use – no \$s, no GHG



The one you produce – as a by-product of your process



The one you procure – specify renewable

# Market Trends



**80%** of the world's top 250 companies include corporate responsibility data in their annual reports, up from 44% in 2011. <sup>1</sup>



**63%** of Fortune 100 companies committed to at least one climate or clean energy target by 2016 <sup>2</sup>

**154**

Companies have committed to RE100 (100% renewable energy).<sup>4</sup>

Utility-scale Offsite Renewable Energy (ORE) procurement for corporate buyers is projected to be expected to reach

**2.7 GW** | **\$3.1B**

in 2027 in North America <sup>3</sup>

1. The KPMG Survey of Corporate Responsibility Reporting 2017

2. World Wildlife Fund, Calvert Investments, CDP, and Ceres, Power Forward 3.0: How the Largest U.S. Companies Are Capturing Business Value while Addressing Climate Change, [April 2017](#).

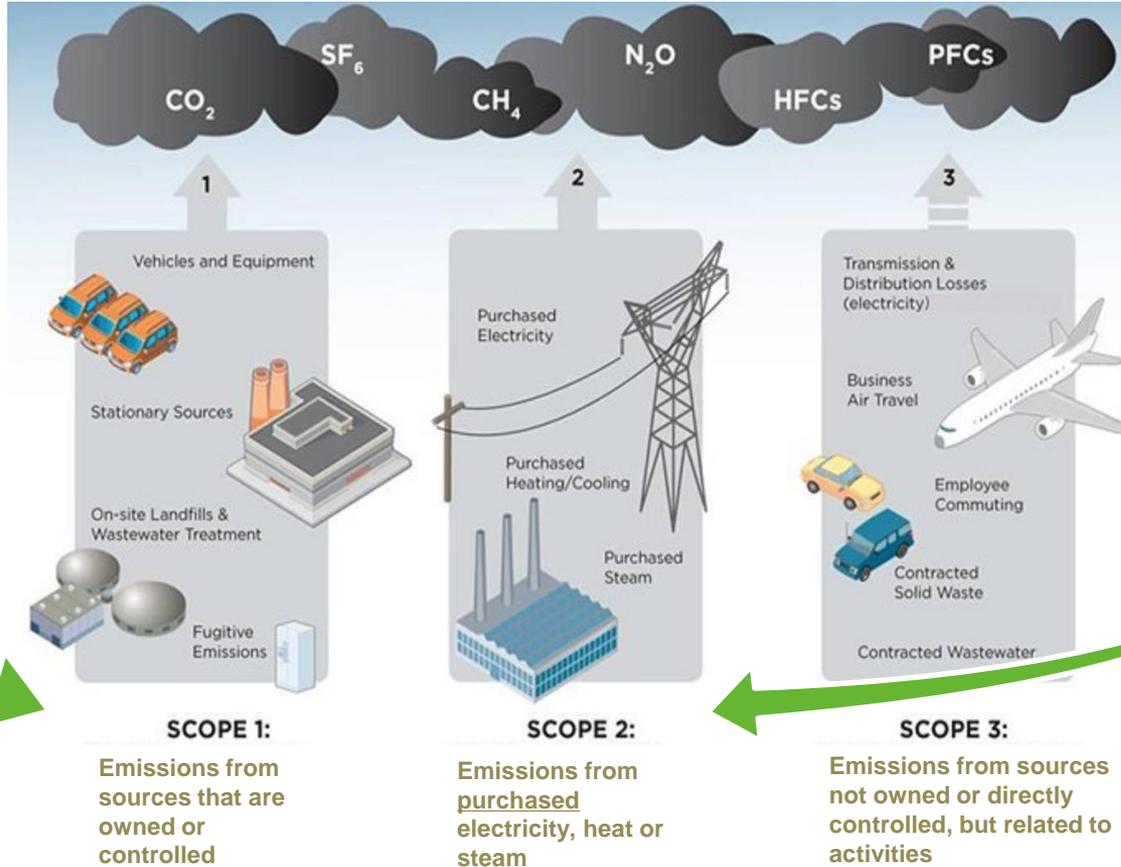
3. Navigant report "Corporate Utility-Scale Offsite Renewable Energy Procurement Solutions" Q2, 2018

4. RE 100 (as of October 2018 <http://there100.org/companies>)

# Energy and EPA Reporting

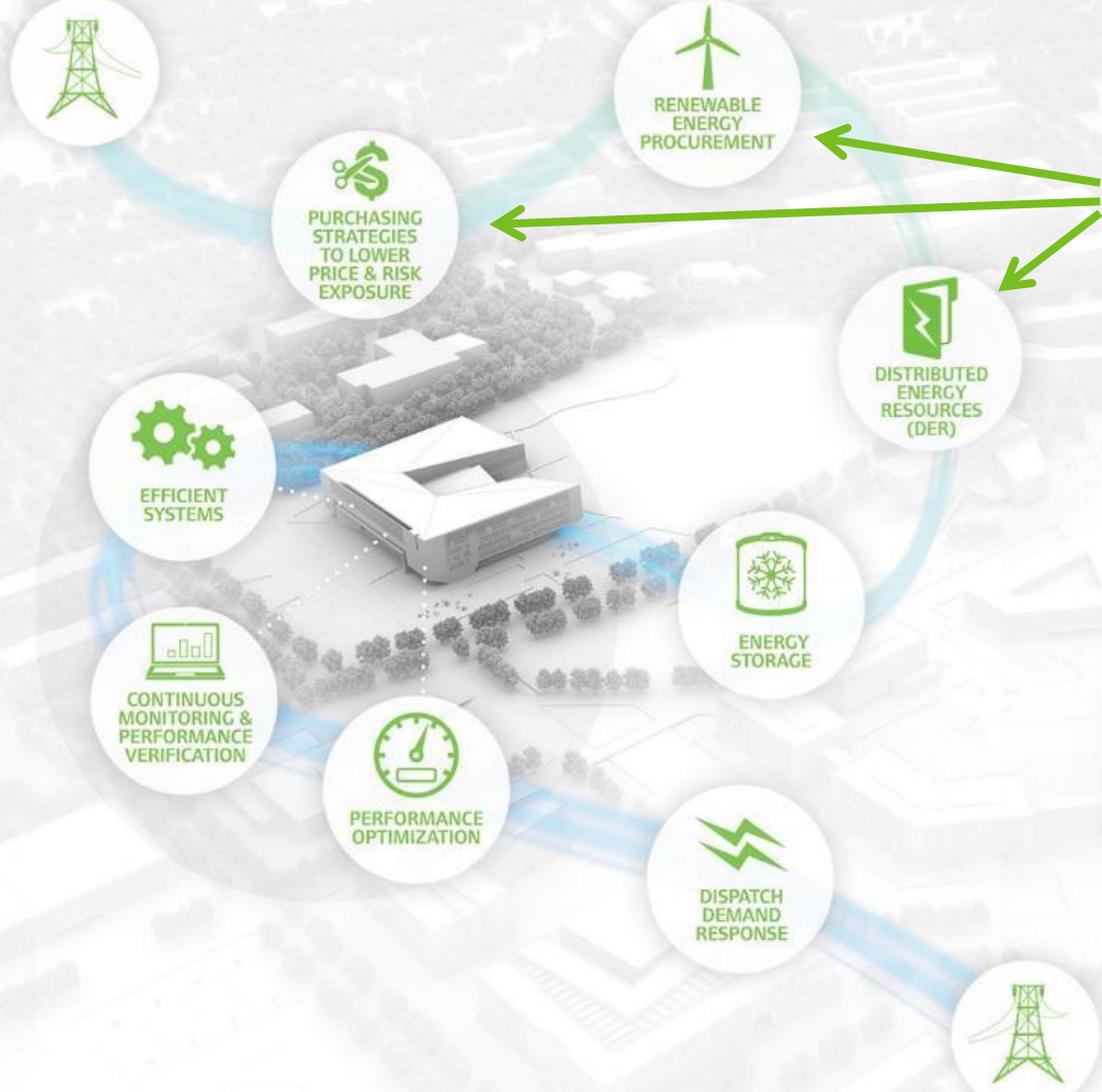


Combustion of fuel for building or process heat is Scope 1!



Electricity generated offsite and consumed by the end user is Scope 2

# Energy “Supply Side” Impacts on Sustainability



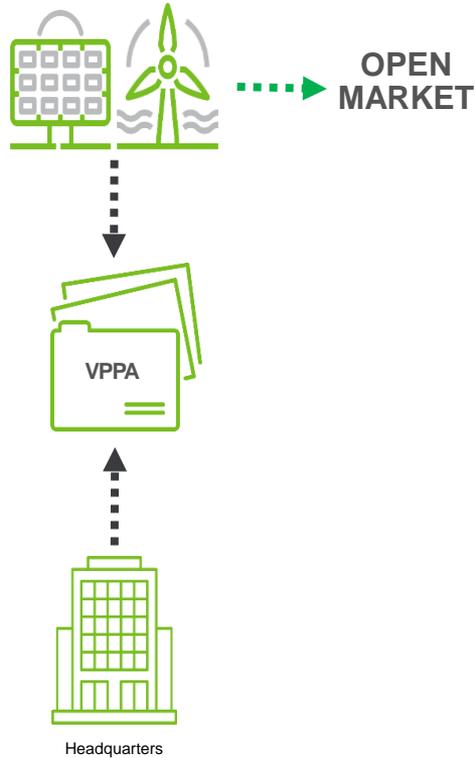
# Case Study – Ingersoll Rand Virtual Power Purchase Agreement

In mid-2018, Ingersoll Rand signed an agreement for approximately 100,000 MWh of wind power annually, from a new wind farm in Baylor County, Texas.

- This single transaction reduces IR's U.S. Scope 2 GHG emissions from electricity by 32 percent
- No capital expenditure or upfront costs
- Expected to generate significant revenue from power sales.
- Project began deliveries June 1, 2019



# Virtual Power Purchase Agreement (VPPA)



Office location



Contract between buyer & renewable energy generator.  
Energy sold to local wholesale market.



No actual physical transfer of energy between electricity generator & buyer



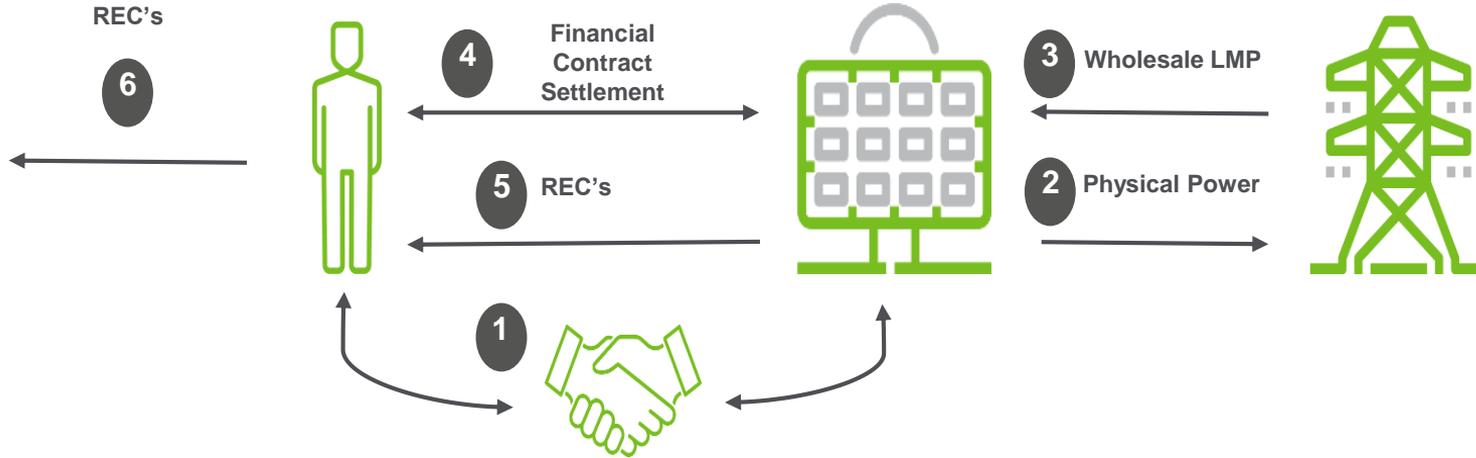
Office location



Location, Future pricing expectations, Length of contract, Additionality

One VPPA could satisfy most or all of organization's renewable energy goals

# How VPPA's Work



1. Agree to fixed price PPA for power and RECs
2. Developer delivers power from project to Electric Grid
3. Developer is paid the market price for power. (LMP)
4. Developer and Customer settle financially for difference
5. Developer delivers RECs to Customer
6. Customer retires RECs to meet environmental reporting or swaps for value

# Why Now?



## Solar Investment Tax Credit (ITC) Step Down



Based on a %  
of the eligible  
investment

## Wind Production Tax Credit (PTC) Step Down



Credit per kWh  
produced based  
on 1.5¢/kWh in  
1993 dollars.

20% Reduction in Wind PTC is equivalent to \$5/MWh.

# Virtual Renewable Natural Gas (NG) Agreements



- Organic waste is gathered from multiple local/regional sources
- A central processing plant converts it to pipeline quality NG
- Sold into wholesale gas market
- Buyer pays fixed price, gets paid index wholesale price (similar to electricity VPPA)
- Buyer gets environmental attributes (called RINs)
- RINs are used to meet Scope 1 reporting requirements
- Environmental attributes may also provide an extra revenue stream

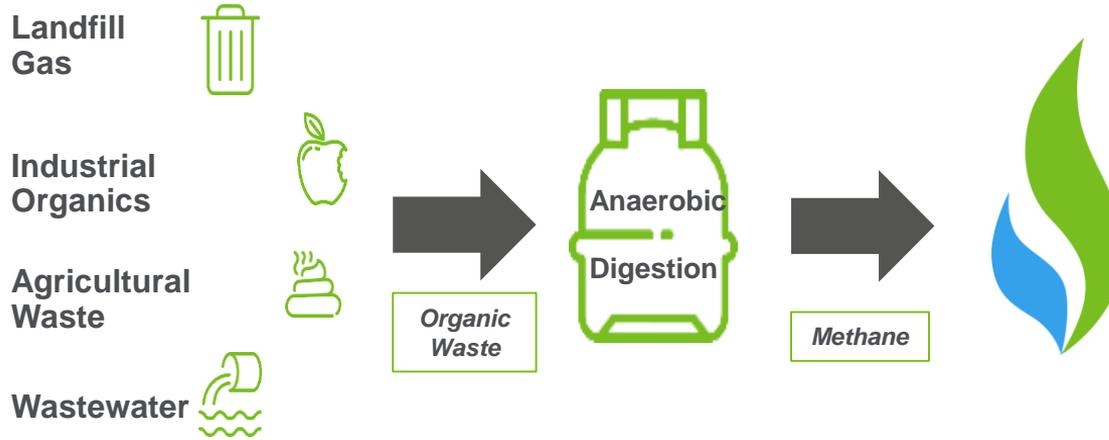


**While natural gas is about 50% cleaner than traditional coal technologies, it still emits roughly 117 pounds of CO2 per million Btu's.**

**And, fugitive methane that is leaked from gas wells and pipelines is 34 times more potent at trapping heat than CO2!**

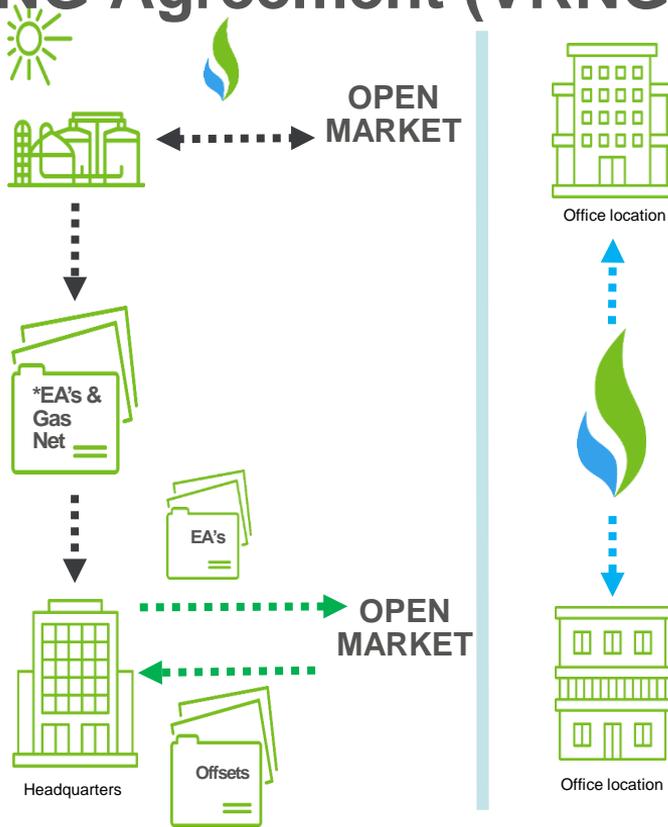
**Renewable natural gas will be a key component of future sustainability efforts.**

# What is it?



- Waste – Landfill gas
- Industrial – Organic waste biogas
- Agriculture – Ag residue biogas (manure, energy crops)
- Sewage – Wastewater treatment biogas

# Virtual RNG Agreement (VRNGA)



Contract between buyer & renewable energy producer.  
Energy sold to local wholesale market.



No actual physical transfer of energy between producer & buyer

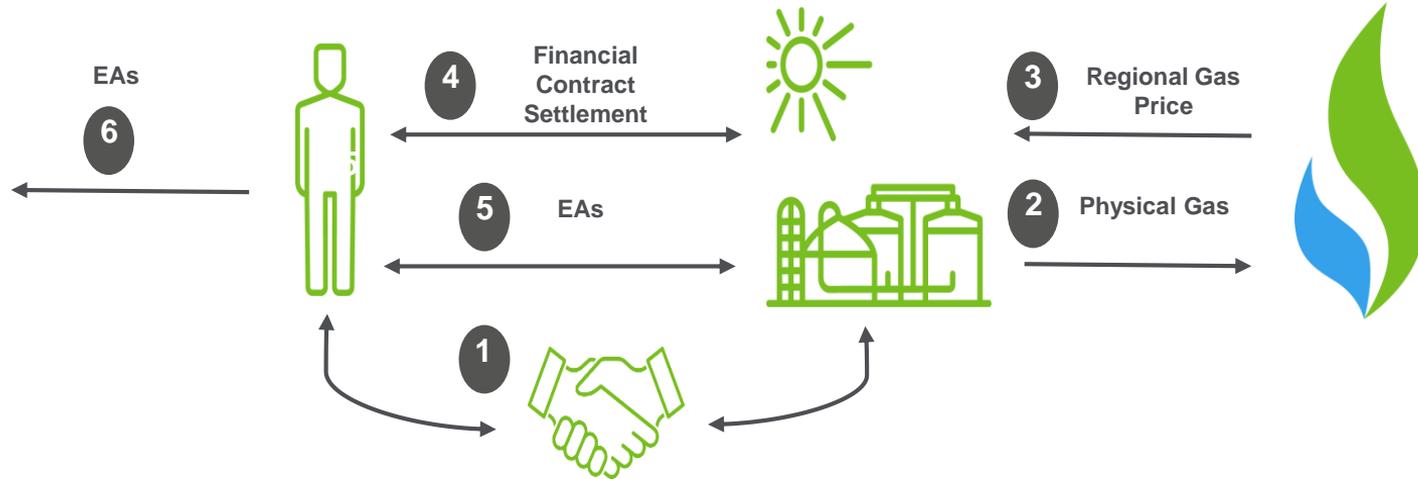


Location, Future pricing expectations, Length of contract, Additionality

\*EA's = Environmental Attributes

One VRNGA could satisfy most or all of organization's thermal renewable energy goals

# How VRNGA's Work

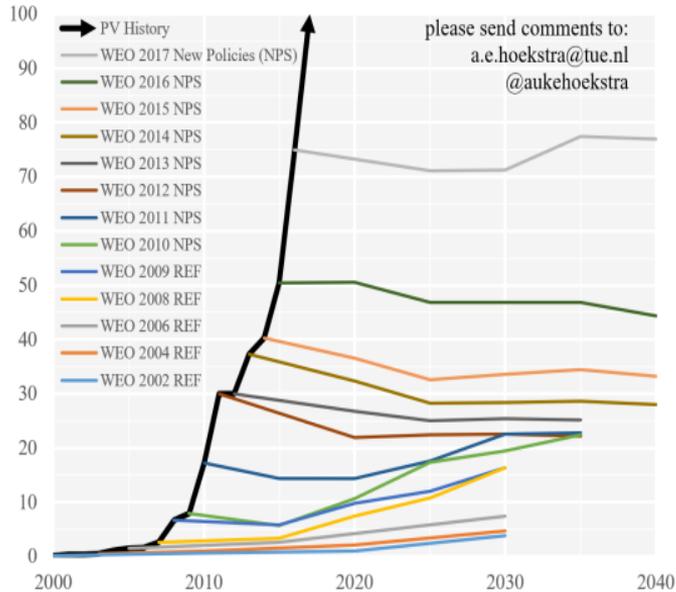


1. Agree to fixed price for gas and environmental attributes (EA)
2. Developer delivers gas from project to pipeline (fixed for floating swap)
3. Developer is paid the market price for gas
4. Developer and Customer settle financially for difference
5. Developer delivers environmental attributes to Customer
6. Customer retires EA's to meet environmental reporting or swaps for value

# Lower installed costs and higher production rates have driven an exponential growth in solar power:



Annual PV additions: historic data vs IEA WEO predictions  
In GW of added capacity per year - source International Energy Agency - World Energy Outlook



**Renewable Natural Gas may be on the cusp of a similar growth trend as technology improves, processing equipment becomes cheaper and more efficient, and as wholesale gas markets develop products to address needs.**

Source: Auke Hoekstra <https://bit.ly/2s0QFND>



**TRANE**<sup>®</sup>

Trane, the Circle Logo, and Let's Go Beyond are trademarks of Trane in the United States and other countries. Green-e is a registered trademark of the Center for Resource Solutions. All trademarks referenced are trademarks of their respective owners.  
© 2019 Trane. All Rights Reserved.

