# NARUC

## CENTER FOR PARTNERSHIPS AND INNOVATION

## RENEWABLE ENERGY OPTIONS FOR LARGE UTILITY CUSTOMERS – JANUARY 16, 2020


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# WHAT IS NARUC

- The National Association of Regulatory Utility Commissioners (NARUC) is a non-profit organization founded in 1889.
- Our Members are the state regulatory Commissioners in all 50 states & the territories. FERC & FCC Commissioners are also members.  NARUC has Associate Members in over 20 other countries.
- NARUC member agencies regulate electricity, natural gas, telecommunications, and water utilities.

# WHAT IS NARUC'S CENTER FOR PARTNERSHIPS AND INNOVATION?

- Grant-funded team dedicated to providing technical assistance to members.
- CPI identified emerging challenges and connects state commissions with expertise and strategies.
- CPI builds relationships, develops resources, and delivers trainings.

## NARUC CPI Topical Areas

Energy Infrastructure & Technology Modernization

Electricity System Transition

Critical Infrastructure, Cybersecurity, Resilience

Emerging Issues

www.NARUC.org/CPI

# WEBINAR LOGISTICS

- We're recording the webinar. It will be posted on NARUC's CPI webpage: https://www.naruc.org/cpi/
- Because of the large number of participants, everyone is in *listen* mode only.
- **Please use the chat box to send us your questions** and comments any time during the webinar. You may want to direct your question to a specific presenter.
- The presenters will respond to questions typed in the chat box during moderated Q&A, following the presentations.

# AGENDA

- About the Future Electric Utility Regulation series
- Three perspectives
  - Utility – Jeff Lyng and Dan King, Xcel Energy
  - Corporate – Steve Chriss, Walmart Inc.
  - Cities – Lori Bird, World Resources Institute
- Q&A with the presenters

# Future Electric Utility Regulation series

- A series of reports from Berkeley Lab taps leading thinkers to grapple with complex regulatory issues for the electricity sector
- Unique multi-perspective approach highlights different views on the future of electric utility regulation and business models and achieving a reliable, affordable, and flexible power system to inform ongoing discussion and debate
- Funded by U.S. Department of Energy's Grid Modernization Initiative
  - Office of Electricity
  - Office of Energy Efficiency and Renewable Energy, Solar Energy Technologies Office
- Expert advisory group provides guidance and review (next slide)

FUTURE ELECTRIC Utility Regulation

**feur.lbl.gov**

# Advisory Group

Chair Jeffrey Ackermann, Colorado Public Utilities Commission
Janice Beecher, Institute of Public Utilities, Michigan State University
Ashley Brown, Harvard Electricity Policy Group
Stephen Caldwell, National Grid
Paula Carmody, Maryland Office of People's Counsel
Ralph Cavanagh, Natural Resources Defense Council
Steve Corneli, consultant
Tim Duff, Duke Energy
Scott Hempling, attorney
Val Jensen, Commonwealth Edison
Steve Kihm, Slipstream
Lori Lybolt, Consolidated Edison
Jeff Lyng, Xcel Energy
Kris Mayes, Arizona State University College of Law/Utility of the Future Center
Jay Morrison, National Rural Electric Cooperative Association
Delia Patterson, American Public Power Association
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Sonny Popowsky, Former consumer advocate of Pennsylvania
Karl Rábago, Pace Energy and Climate Center, Pace University School of Law
Rich Sedano, Regulatory Assistance Project
Chair Sally Talberg, Michigan Public Service Commission
Commissioner Jordan White, Utah Public Service Commission

# Reports to date

1. *Distributed Energy Resources (DERs), Industry Structure and Regulatory Responses*
2. *Distribution Systems in a High DER Future: Planning, Market Design, Operation and Oversight*
3. *Performance-Based Regulation in a High DER Future*
4. *Distribution System Pricing With DERs*
5. *Recovery of Utility Fixed Costs: Utility, Consumer, Environmental and Economist Perspectives*
6. *The Future of Electricity Resource Planning*
7. *The Future of Centrally-Organized Wholesale Electricity Markets*
8. *Regulatory Incentives and Disincentives for Utility Investments in Grid Modernization*
9. *Value-Added Electricity Services: New Roles for Utilities and Third-Party Providers*
10. *The Future of Transportation Electrification*
11. *Utility Investments in Resilience of Electricity Systems*
12. *Renewable Energy Options for Large Utility Customers* (**Today's topic**)

**Report will be posted at feur.lbl.gov**

Additional reports forthcoming, including report #13, *All-Source Competitive Solicitations: State and Electric Utility Practices*.

**Reports, webinar slides and recordings at feur.lbl.gov**

# TODAY'S SPEAKERS

**Jeff Lyng** is the Director of Energy & Environmental Policy at Xcel Energy, a U.S. utility serving 3.6 million electricity customers and 2 million natural gas customers in eight states. He is responsible for developing strategy and policies that will continue the company's leadership in the clean energy transition while keeping customer bills low. In prior roles, Lyng was a Senior Policy Advisor with the Center for the New Energy Economy at Colorado State University, Renewable Energy Policy Manager in Colorado Governor Bill Ritter's administration and Director of Western states Regulatory Affairs for Opower.

**Dan King** is Team Lead, Product Strategy and Development, for Xcel Energy. Previously, he was Program and Policy Director of the Midwest Renewable Energy Tracking System. He also was an AAAS Science and Technology Policy Fellow at U.S. Department of Energy.

**Steve Chriss** is Director, Energy and Strategy Analysis, for Walmart Stores, Inc. He joined the company in 2007 after serving as a senior analyst and economist at the Oregon Public Utility Commission. He previously served as senior analyst at the consulting firm Econ One Research, Inc. Chriss holds a master's degree in agricultural economics from Louisiana State University. Walmart operates over 11,300 stores under 58 banners in 27 countries and e-commerce websites in 10 countries.

**Lori Bird** is Director of the U.S. Energy Program and the Polsky Chair for Renewable Energy at World Resources Institute (WRI). She focuses on decarbonization by the utility sector and large buyers, increasing grid flexibility through market design, and transportation electrification. Before joining WRI, she was a principal analyst in the Markets and Policy Group of National Renewable Energy Laboratory. She serves on the Advisory Board for the Renewable Energy Buyers Alliance.

# QUESTIONS THE REPORT ADDRESSES

1. How can utilities help large customers achieve their own renewable energy goals as they approach very high levels? And how should 100 percent renewable energy products be defined and disclosed?
2. What is the range of options for a utility providing 100 percent renewable energy products, and what are the implications of each of these options?
3. How can pace and cost be considered in procurement to achieve high renewable energy goals? And how can any negative impacts or risks be mitigated?

**Please use the chat box** to send us your questions and comments any time during the webinar. You may want to direct your question to a specific presenter. We'll address as many questions as we can following the presentations.

# Renewable Energy Options for Large Utility Customers: A Utility Perspective

Jeff Lyng and Dan King

Xcel Energy

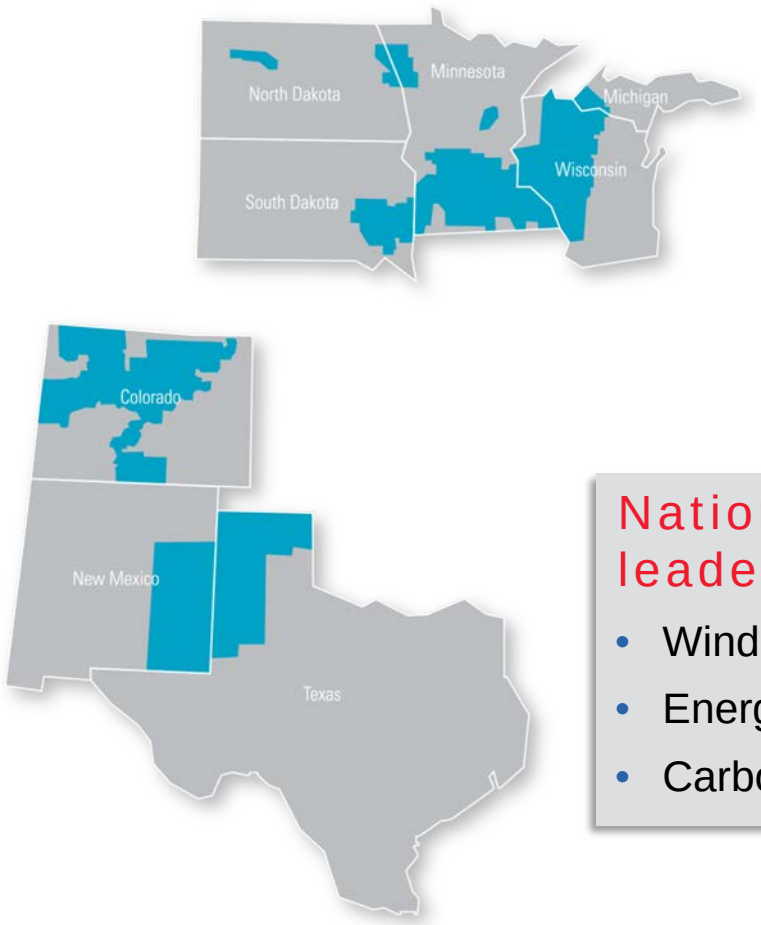
# About Xcel Energy

**FOUR**
Operating companies

**EIGHT**
States

**3.6 M**
Electric customers

**2.0 M**
Natural gas customers




**Nationally recognized leader:**

- Wind energy
- Energy efficiency
- Carbon emissions reductions

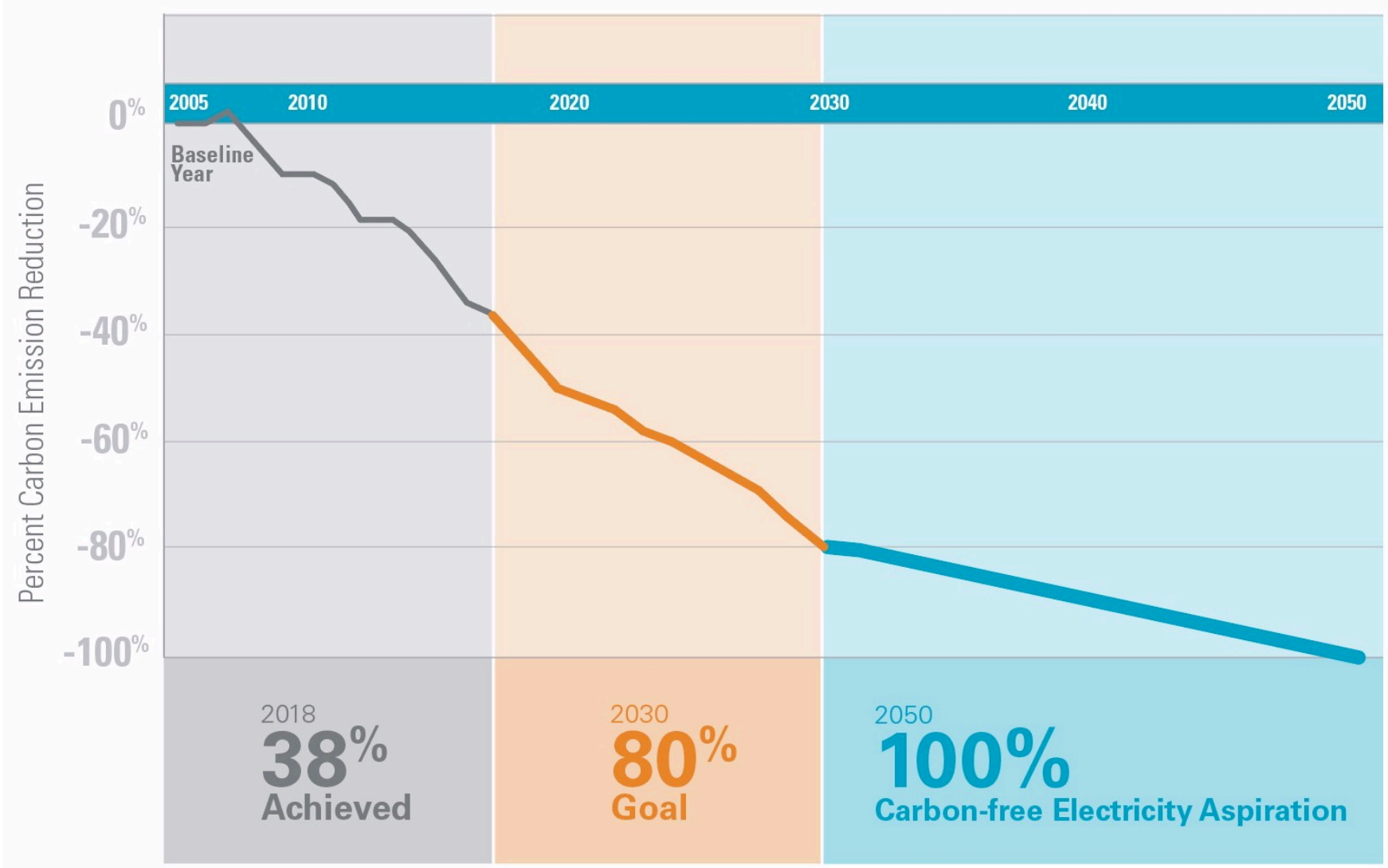
# Xcel Energy Strategic Priorities

Lead the Clean Energy Transition

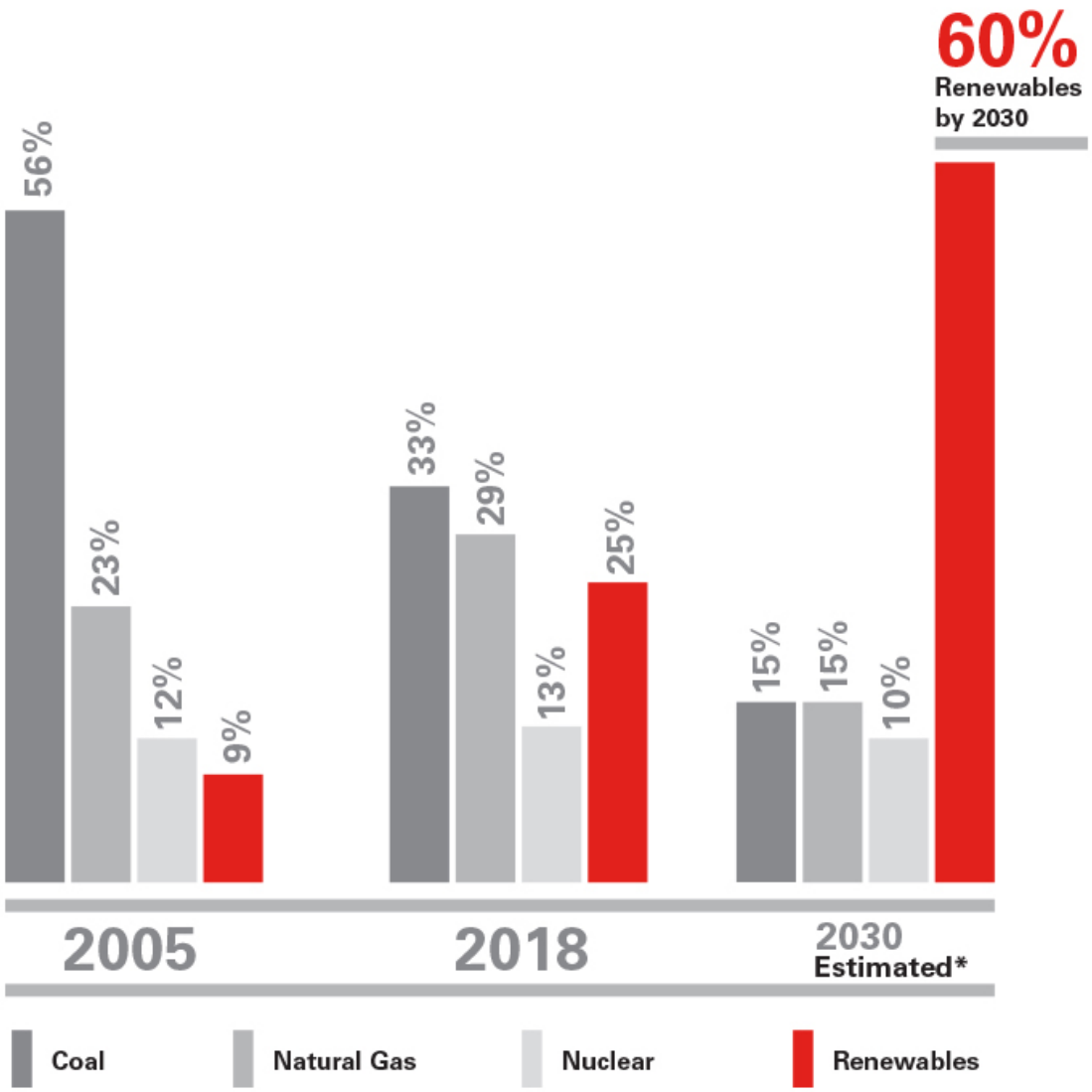
Enhance the Customer Experience

Keep Bills Low

# Our Carbon-free Future



# A Cleaner Energy Mix



# Private Sector Customer Goals

## 3M Announces 100% Global Renewable Electricity Goal with Headquarters Campus Converting to all Renewables Immediately

Builds on Recent Pledge to Integrate Sustainability into All New Products This Year, Joins RE100, Partners with Xcel Energy, Inc.

Thursday, February 28, 2019 12:01 am CST

## Target Just Announced Our Most Ambitious Climate Goals Yet

**March 27, 2019** - Article reads in 4 minutes COMPANY

## From Kaiser To Vail Ski Resorts, Companies Doubled Their Wind And Solar In 2018

By Grace Hood | February 12, 2019

OCTOBER 26, 2017

## Best Buy To Reduce Carbon Emissions 60% By 2020

SUZANNE HILKER STAFF WRITER

# Community Carbon and RE Goals

| Carbon Reduction Goals | |
|---|---|
| **Minnesota** | |
| **Mahtomedi** | 100% by 2050 |
| **Edina** | 30% by 2025 |
| **Minneapolis** | 80% by 2050 |
| **Saint Paul** | 100% by 2050 |
| **Eden Prairie** | 80% by 2050 |
| **Saint Louis Park** | 100% by 2040 |
| **Red Wing** | 25% reduction |
| **Winona** | 100% by 2050 |
| **Wisconsin** | |
| **Eau Claire** | 100% by 2050 |
| **Colorado** | |
| **Boulder** | 80% by 2050 |
| **Denver** | 80% by2050 |
| **Englewood** | 12% by 2030 |
| **Fort Collins** | 100% by 2050 |
| **Lafayette** | 80% by 2050 |
| **Lakewood** | 50% by 2050 |
| **Garfield County** | 100% by 2040 |

| Renewable Energy Goals | |
|---|---|
| **Minnesota** | |
| **Minneapolis** | 100% by 2022 for municipal facilities<br>100% by 2030 community-wide |
| **St Louis Park** | 100% by 2030 |
| **St. Cloud** | 80% by 2018 |
| **Wisconsin** | |
| **Eau Claire** | 100% by 2050 |
| **La Crosse** | 25% by 2025 |
| **Colorado** | |
| **Boulder** | 100% by 2030 |
| **Breckenridge** | 100% by 2025 for municipal facilities<br>100% by 2035 community-wide |
| **Denver** | 100% by 2030 |
| **Fort Collins** | 20% by 2020 |
| **Lafayette** | 100% by 2030 |
| **Lakewood** | 45% by 2025 |
| **Longmont** | 100% by 2030 |
| **Nederland** | 100% by 2020 for municipal facilities<br>100% by 2025 community-wide |
| **Garfield County** | 35% by 2020 |
| **Pueblo County** | 100% county-wide by 2035 |
| **Summit County** | 100% community-wide by 2035 |

# Corporate Renewable Buyer's Principles

Xcel Energy has used these principles as core tenants of new products, such as Renewable*Connect.

1. "Bundled" MWh with RECs
2. Preventing double-counting
3. Within a reasonable proximity to the customer

# Renewable Energy Options

Subscription

On-Site

**Renewable*Connect**

Easy, long-term contracts available

REC

**Windsource**

Easy to join, short-term contracts

REC

**Solar*Rewards Community**

Support a 3rd party-owned solar garden, get paid for production

No REC

**Solar*Rewards**

Net metering bill credits, production incentives

No REC

**Net Metering**

Bill credits, keep and claim RECs

REC

**Certified Renewable Percentage**

Get credit for your proportion of our system renewables

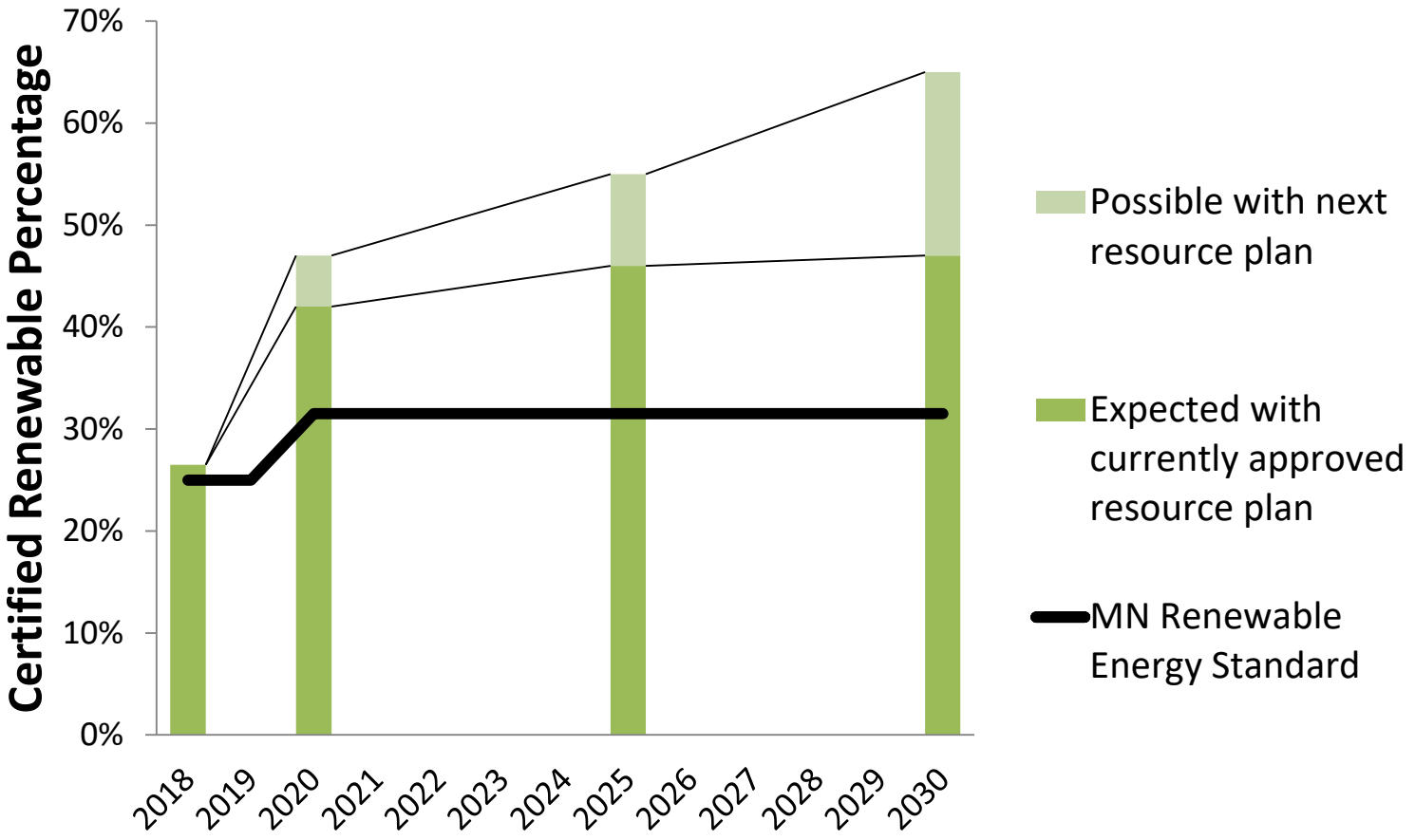
REC

# Certified Renewable Percentage

- A new reporting structure to help clarify how customers can count system renewables toward their goals if they choose
- Backed by RECs retired for RES compliance and additional RECs voluntarily retired on behalf of all retail customers
- It is ***not*** a program that customers need to enroll in or pay extra for.

$$\frac{\text{Total renewable energy generated (MWh)} - \left(\text{Adjustments for generation associated with voluntary renewable programs, REC sales, wholesale REC transfers etc.}\right)}{\text{Total energy used by retail customers (MWh)}} = \text{CRP}$$

# CRP in Minnesota




*Note: CRP is different from renewable energy as a share of generation*

# Renewable*Connect

- Energy + RECs from specific projects (Solar + Wind in MN/WI, Solar in CO)
- Flexible terms
- Choice of subscription size
- Pre-set pricing with fuel + capacity credit
- Neutrality adjustment built in to ensure program costs are not shifted to non-participants.

xcelenergy.com/RenewableConnect

# Key Takeaways

- Transition must be affordable, balanced, and reliable
- Base electric offering fast approaching 50% RE; 60% RE by 2030
- Technical assistance and products to enable customers to go further, faster, consistent with Corporate Buyer's Principles
- Carbon-free aspiration for the 'big grid'

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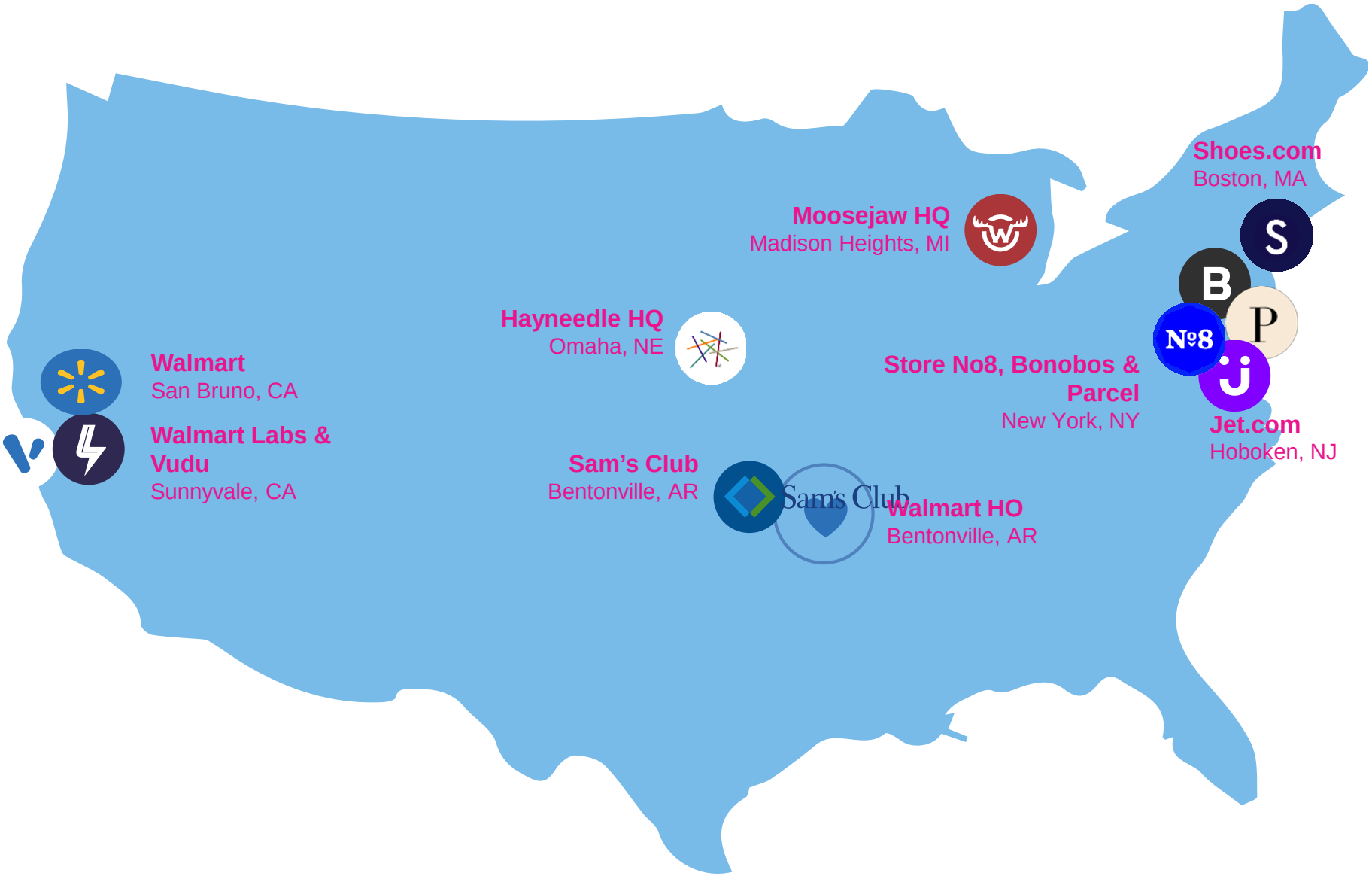
# Renewable Energy Options for Large Utility Customers: A Corporate Perspective

Steve Chriss

Walmart Inc.

# The Walmart Family



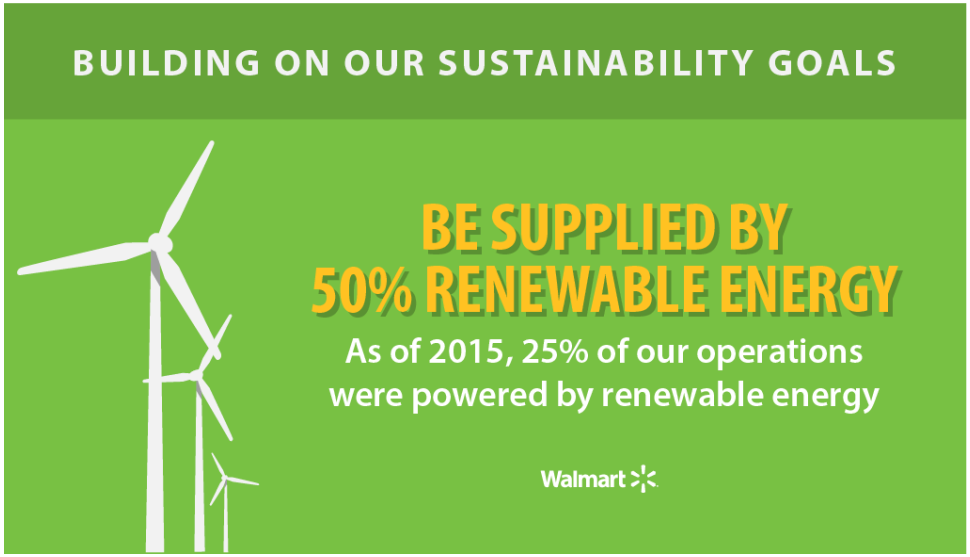
# Walmart & Sam's U.S. Footprint

- All 50 States, D.C., Puerto Rico
- 5,362 Retail Units
- Over 176 Distribution Centers and Logistics Facilities
- 1.5 Million Associates

# Walmart's 2025 Energy Commitments

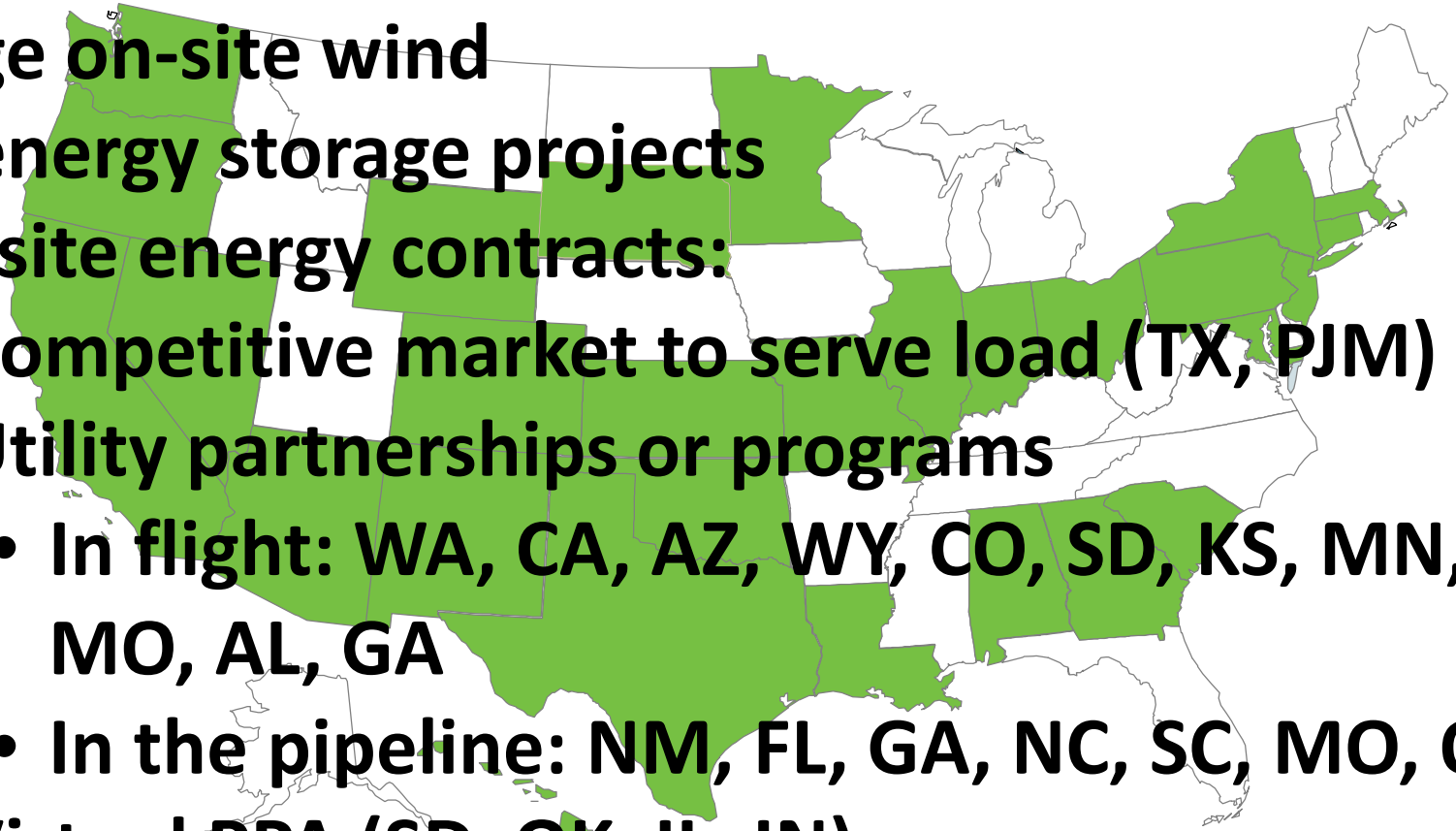
- **In 2005 we set an aspirational goal to be powered 100% by renewable energy**

- **On November 4, 2016 we announced new sustainability goals for 2025 that build on our existing energy goals**
  - Be supplied by 50% renewable energy
  - Use a combination of energy efficiency and renewable energy to reduce emissions in our operations by 18 percent
  - Target is science-based, which is the level of decarbonization needed to keep global temperature increase below 2C compared to pre-industrial temperatures




# Walmart Renewable Energy in the U.S.

- Over 360 installed on-site solar projects
- Large on-site wind
- 19 energy storage projects
- Off-site energy contracts:
  - Competitive market to serve load (TX, PJM)
  - Utility partnerships or programs
    - In flight: WA, CA, AZ, WY, CO, SD, KS, MN, MO, AL, GA
    - In the pipeline: NM, FL, GA, NC, SC, MO, OR
  - Virtual PPA (SD, OK, IL, IN)



# Walmart's Project Gigaton

ProjectGigaton™

*Six Pillars of the Program*


Learn more at *walmartsustainabilityhub.com*

# Walmart Renewable Procurement

General parameters for renewable procurement from utilities:

1. We do not enter into premium structures or programs that only result in additional cost to our facilities

2. Renewable resources that deliver industry-leading cost, including renewable and project-specific attributes such as RECs

3. Participating customer takes on incremental risk of being served by the renewable resource instead of, or in addition to, the otherwise applicable resource portfolio

4. Participating customer receives any potential benefits brought about by taking on that risk

5. Do not enter programs with terms in excess of 15 years

# Walmart Renewable Procurement

**Three Channels to Secure Resource Supply**

## Off-Site

- In deregulated retail markets, structure for renewable energy to replace other energy, both physically and on the bill
- Texas Retail Energy, a wholly owned subsidiary of Walmart
- Virtual Power Purchase Agreements

## On-Site

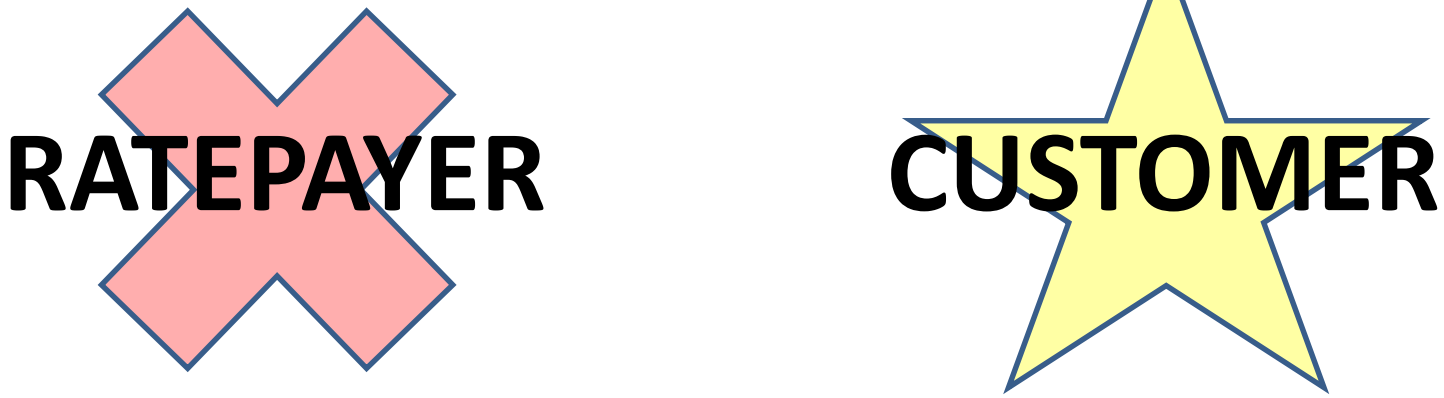
- Replaces grid energy with energy from on-site resource
- Reduce operating costs for the site
- Net metering compensation is not a driver

## Utility Partner

- Work with utilities to develop workable and economic structures within the confines of regulatory compact
- Some potential models
  - Green tariff or sleeved resource
  - Shared resource (community or large scale)
  - On-site partnerships

# 1. How Can Utilities Help?

**The first step is broader and more comprehensive than simply crafting a tariff: a utility needs to establish a customer-centric culture within their customer service and regulatory organizations**



# 1. How Can Utilities Help?

**Key Operational Principles:**

1. **Communication and openness are critical**

2. **There is no single best structure that can be used for any utility**

3. **Understanding and working within each utility's unique system and regulatory and ratemaking structures will lead to success**

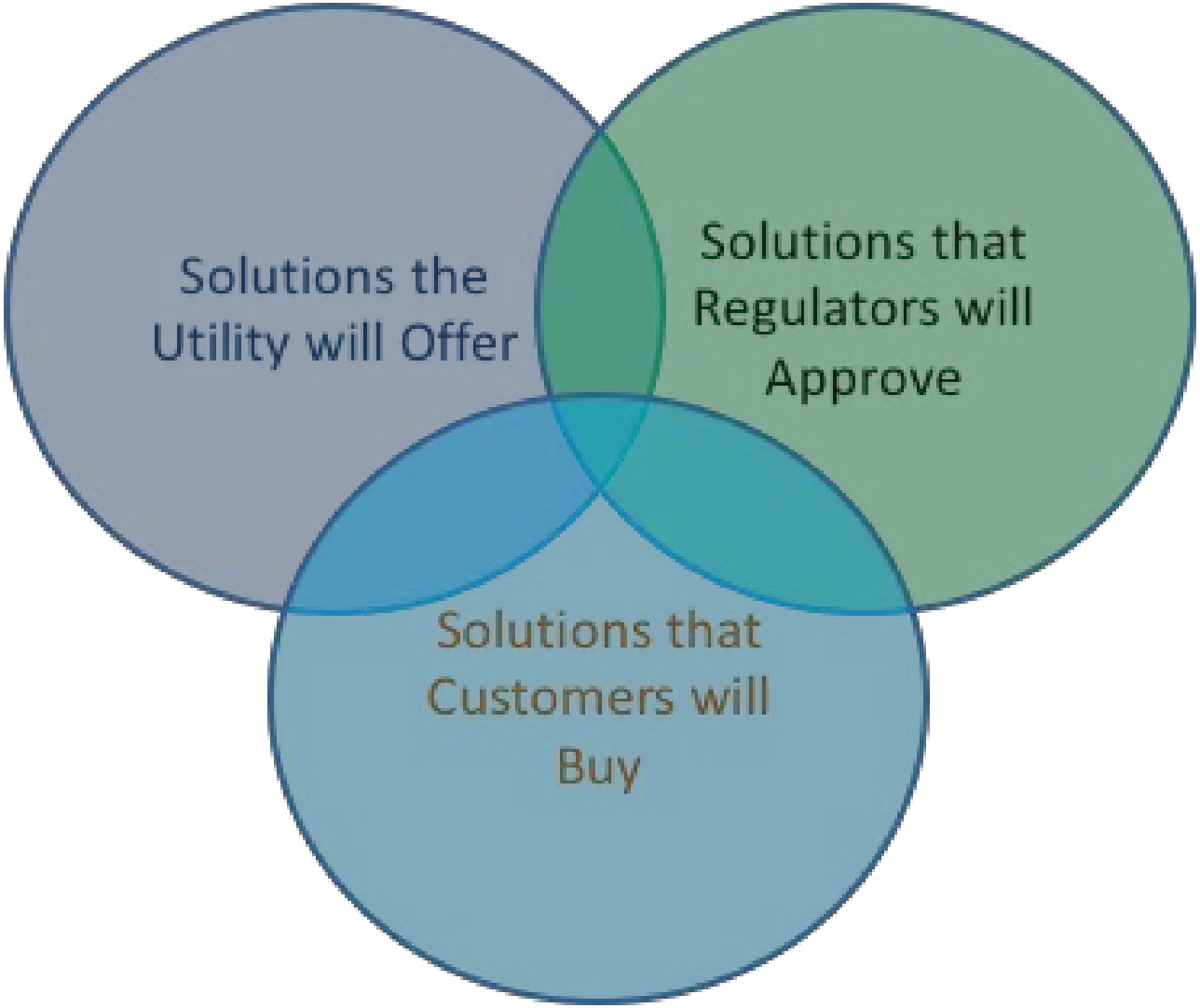
**Opportunity Points**

- **Key account managers**
- **Edison Electric Institute Key Accounts Program**
- **Touchstone Energy NET Conference**
- **APPA Customer Connections Conference**

# 1. How Can Utilities Help?

| Mapping the Opportunity from the Customer Viewpoint | | |
|---|---|---|
| • Renewable energy and associated environmental attributes<br>• Capture the full economic value of the transaction and opportunity to realize bill savings<br>• Flexibility to meet risk and financial preferences | **NEEDS**<br>↓ | • Maintain existing business load and attract new load<br>• Diversify generation portfolio, reduce fuel risk<br>• Benefit or at least have no negative impact for all customers |
| **CUSTOMER →** | **PROGRAM** | **← UTILITY** |
| • Cost versus otherwise applicable rates<br>• Contract/program length<br>• Termination provisions<br>• Footprint within the utility territory<br>• Scale of available resources<br>• Ability to participate in the approvals process | ↑<br>**CONSTRAINTS** | • Impact on nonparticipating customers<br>• Approvals process<br>• Disconnect between wholesale and retail<br>• Program administration<br>• Size of utility<br>• Customer footprint within the utility territory<br>• Scale of available resources |

# 2. Options and Implications



# 2. Options and Implications

- **Resource Ownership:** Walmart open to both utility ownership and PPA and also supports programs that allow customers to "bring your own resource"

- **Value Proposition**
  - **Cost Side:** Reflects the cost of the resource plus any additional costs to procure or transmit the power or administer the program

  - **Credit Side:** Reflects the underlying utility cost and rate structures, and regulatory familiarity is important – a program has a better chance of acceptance if the credit can be structured in a way that the regulators have worked with and understand

# 2. Options and Implications

- **From our experience:** The best starting point for the credit side is the marginal energy costs avoided by the utility bringing on the program resource: avoided fuel, purchased power, and variable generation costs

- Optimally, the extent to which the resource brings capacity value to the system should be included in the value proposition
  - Can be controversial

# 2. Options and Implications

- Resulting credit structures can be:
  - Very simple - program cost vs. fuel rate (e.g., Westar and KCP&L programs in KS)
  - Highly complex - program cost vs. hourly liquidation at wholesale market or utility marginal cost (e.g., Georgia Power)

- Simple vs. complex
  - As a customer, the more complex a credit is the harder it is to understand and forecast potential cost impacts
  - Flipside – the more fixed and simple a credit is, the less likely that it directly reflects the value of the program resource on the utility system

# 3. How to Get it Done Today

- Speed to market and empowered regulators are crucial for renewable program development

- In competitive retail markets, customers can choose generation products that better meet their needs, including but not limited to pricing and generation mix
  - Through renewable programs, customers are relying on their utility to mimic these choices

- The regulation of utilities serves as a substitute for price discipline of competitive markets to protect customers from monopoly power
  - Regulators should ensure that they serve as an enabler of utility products that provide benefits similar to products available in the competitive markets

# 3. How to Get it Done Today

- Regulators should have authority to approve programs in a time-efficient manner while ensuring that interested stakeholders have a process to provide input

- Given that most programs are 10 to 20 years in length, it's not likely possible to fully anticipate and quantify any and all costs and benefits
  - Imperative to ensure that programs are created with cost of service principles in mind and that participants bear full economic value of the transaction

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# Renewable Energy Options for Large Utility Customers: A City-Focused Perspective

Lori Bird

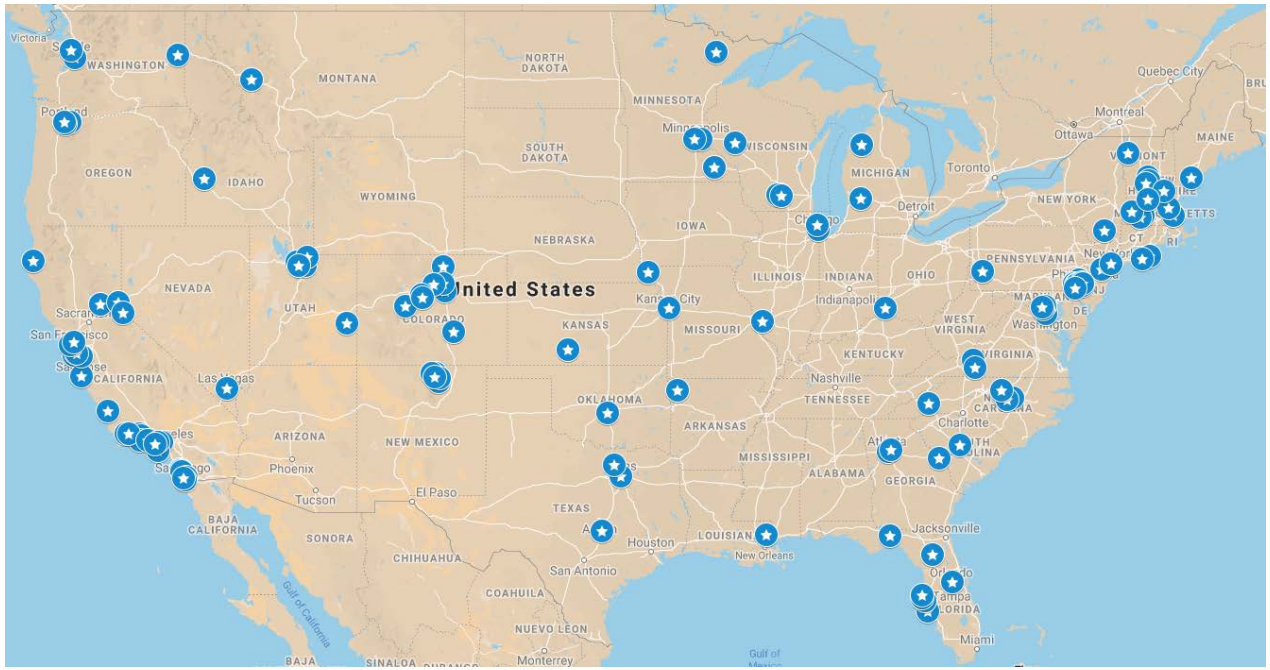
World Resources Institute

# World Resources Institute (WRI) Overview

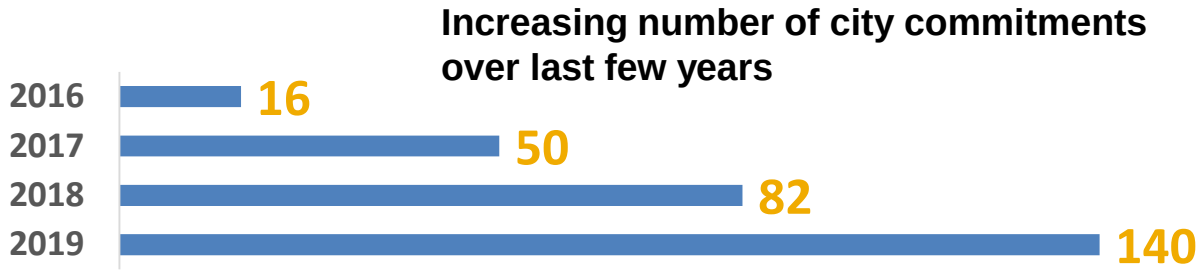
- WRI is global sustainability non-profit
- Approximately 1000 employees
- Offices in the U.S. and 6 other countries
- History of working with large energy buyers, Green Power Market Development Group

- Partner in Bloomberg American Cities Climate Challenge
- City Renewables Accelerator
  - Provides technical assistance to cities
  - Facilitating peer exchange among 100+cities
  - www.cityrenewables.org

# City Renewable Energy Goals




Source: Based on data from: Sierra Club, NAZCA, BNEF, CDP



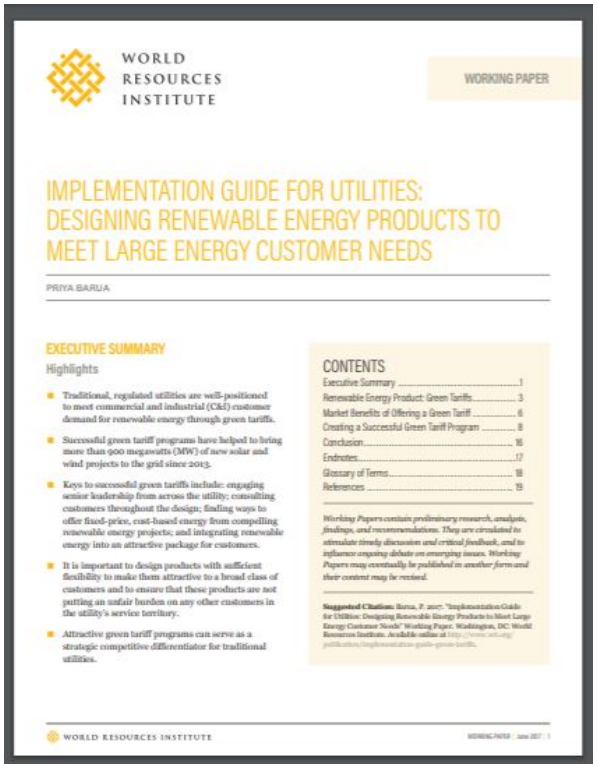

Local governments with 100% community-wide renewables goals:

- >140 cities spanning 30 states
- >200 TWh of electricity demand
- Often goals for municipal procurement are first

# Cities/Large Buyer Renewable Energy Needs

***Large customers typically want:***

- New renewable energy projects
- Large volume of energy
- Cost savings from renewables over time
- Cost certainty/fixed costs of renewables (e.g., no fuel cost variability)
- Moderate term contracts
- Contracting flexibility
- Local renewable energy projects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WORKING PAPER

IMPLEMENTATION GUIDE FOR UTILITIES: DESIGNING RENEWABLE ENERGY PRODUCTS TO MEET LARGE ENERGY CUSTOMER NEEDS

PRIYA BARUA

EXECUTIVE SUMMARY

Highlights

- Traditional, regulated utilities are well-positioned to meet commercial and industrial (C&I) customer demand for renewable energy through green tariffs.
- Successful green tariff programs have helped to bring more than 900 megawatts (MW) of new solar and wind projects to the grid since 2013.
- Keys to successful green tariffs include: engaging senior leadership from across the utility; consulting customers throughout the design; finding ways to offer fixed-price, cost-based energy from compelling renewable energy projects; and integrating renewable energy into an attractive package for customers.
- It is important to design products with sufficient flexibility to make them attractive to a broad class of customers and to ensure that these products are not putting an unfair burden on any other customers in the utility's service territory.
- Attractive green tariff programs can serve as a strategic competitive differentiator for traditional utilities.

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*Working Papers contain preliminary research, analysis, findings, and recommendations. They are circulated to stimulate timely discussion and critical feedback, and to influence ongoing debate on emerging issues. Working Papers may eventually be published in another form and their content may be revised.*

**Suggested Citation:** Barua, P. 2017. "Implementation Guide for Utilities: Designing Renewable Energy Products to Meet Large Energy Customer Needs" Working Paper. Washington, DC: World Resources Institute. Available online at http://www.wri.org/publication/implementation-guide-green-tariffs.

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Cities can differ from corporate buyers in that they:

- typically have existing loads
- can have additional contracting limits/challenges
- often strongly prefer local projects

https://www.wri.org/publication/implementation-guide-green-tariffs

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# How Can Utilities Help Cities Achieve RE Goals?

- **Supporting new renewable energy facilities**
- **Partnering on local projects** where the customer has facilities and operations
- **Ensuring replicability of solutions** so that a customer's actions increase RE access

| City | Stated Commitment - Communitywide Load (% RE) | Target Date |
|---|---|---|
| Atlanta, Ga. | 100 | 2035 |
| Boulder, Colo. | 100 | 2030 |
| Fayetteville, Ark. | 100 | 2050 |
| Madison, Wis. | 100 | TBD |
| Orlando, Fla. | 100 | 2050 |
| Portland, Ore. | 100 | 2050, already met |
| Salt Lake City, Utah | 100 | 2032 |
| San Diego, Calif. | 100 | 2035 |
| San Jose, Calif. | 100 | 2022 |
| San Francisco, Calif. | 100 | 2030 |
| Santa Monica, Calif. | 100 | 2030 |
| St. Louis, Mo. | 100 | 2035 |

*Sources: America's Pledge Initiative on Climate (2018); CDP Worldwide (2016); DOE (2018)*

- **Driving deliberate, long-term grid decarbonization**
  - long term contracts for clean energy
  - other collaborative approaches (e.g. storage, electrification, demand response)

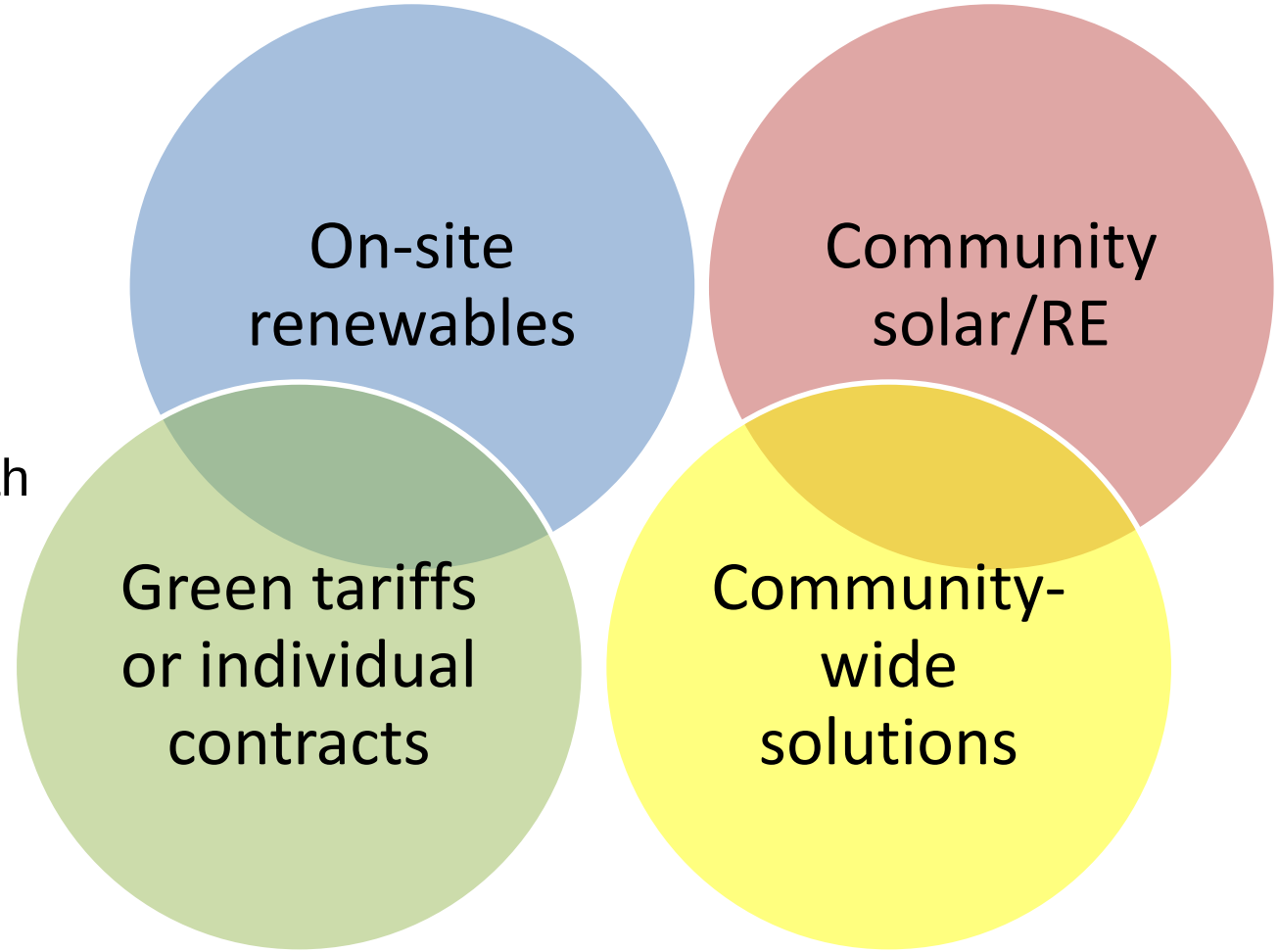
# Renewables Procurement Options

**What is the range of options for renewable energy products?**

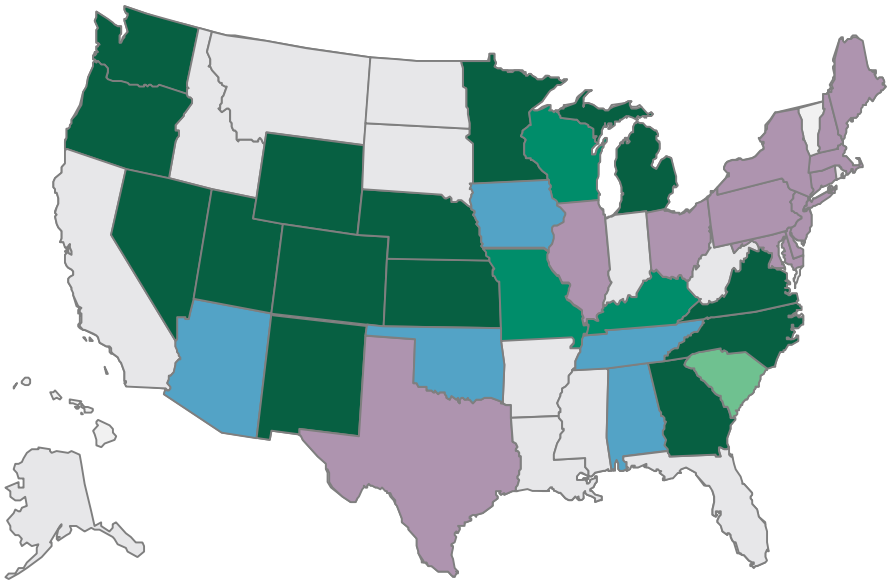
Cities often want to procure a mix of:

- on-site
- community-scale
- large scale RE

Cities often have both municipal and community-wide goals



# Utility Green Tariff Availability




Source: WRI and REBA

- 19 utilities offer 31 programs
- 3.2 GW of new renewables contracted
- 8 green tariffs approved or pending approval in 2019
- several others under development

## New Green Tariff Programs

| | | |
|---|---|---|
| Georgia | Georgia Power | Customer Renewable Supply Procurement (CRSP) |
| Kentucky | Duke Energy | Green Source Advantage, GSA |
| Kentucky | LG&E-KU | Standard Rate Rider Green Tariff |
| Michigan | DTE Energy | Large Customer Voluntary Green Pricing Program (LCVGP), Rider 19 |
| New Mexico | Public Service Company of New Mexico (PNM) | Solar Direct |
| North Carolina | Duke Energy | Green Source Advantage, GSA |
| Oregon | Portland General Electric | Green Energy Affinity Rider (GEAR) |
| Virginia | Dominion Energy | Schedule RF |

# Green Tariff Options and Sleeved PPAs

A range of green tariff structures and power purchase agreements (PPAs) are used to serve large customers.

| Green Tariff Form | Key Considerations | Examples |
|---|---|---|
| **Physical PPA Model via the Utility (or Sleeved PPA)** | • Energy charge will likely be fixed, based on the PPA<br>• Likely one customer per RE project<br>• Potential to influence the resource procured | • Utah, Rocky Mountain Power, Schedule 34<br>• Nevada, NV Energy, Green Energy Rider |
| **Subscriber Model** | • Energy charge will likely be fixed, based on the PPA<br>• Multiple customers accessing one RE project, likely secured by the utility | • Colorado & Xcel Energy, Renewable*Connect<br>• Washington, Puget Sound Energy, Green Direct |
| **Market-Based Rate Model** | • Energy charge will vary based on market conditions<br>• Potential to influence the resource procured within the wholesale market<br>• May require additional or independent renewable energy certificate (REC) management | • Virginia, Dominion Energy, Schedule MBR<br>• Nebraska, Omaha Public Power District, Schedule No. 261 M |

# Example Green Tariffs and Terms

Contract terms, the amount of renewables, and crediting varies across programs.

| | Missouri - Ameren | Washington - Puget Sound Energy | Wisconsin - MG&E |
|---|---|---|---|
| **Green Tariff Name** | RE Choice Program | Green Direct | RE Energy Rider |
| **Tariff Type** | Subscriber Product | Subscriber Product | Sleeved PPA, and/or Subscriber Product |
| **Tariff/Contract Structure** | Customer enters into a fixed-price RE offering for up to 100% of annual usage. Ameren procures RE through 3rd party. | Customer enters into service agreement that outlines energy costs for RE. Customer must contract for 100% of load at all meters. | Customer enters into a RE Energy Rider service agreement for new or existing RE resources. |
| **Pilot Size** | Capped at 400 MW; additional capacity will be considered when program fully subscribed | Aggregate subscription limited to ~287 MW across two tranches | Existing customers capped at 25 MW with potential to increase cap. No limits for new customers. |
| **Contract Time Commitment** | 15-year term | 10, 15 or 18 years | Negotiated term approved by the Commission |
| **RE Deals Signed/Committed** | Enrollment period has closed. | Fully subscribed by local governments, states, universities and corporates. | 8 MW solar project will be used by a county |

Source: Barua and Bonugli (2018)

# City Participation in Green Tariffs – Bellevue

*Key elements that enabled the purchase:*

- *Fuel cost savings*
- *New renewables*

**Bellevue, WA – Puget Sound Green Direct**

Bellevue entered into Puget Sound Energy's Green Direct program (Schedule No. 139) under a 20-year contract to supply 70% of the city's municipal load with new wind and solar. Starting in 2019, the city's Fire, Parks, and Finance and Asset Management departments plan to purchase 10.3 million kWh of renewables, while the city's Utility Department agreed to purchase 3.2 million kWh starting in 2021.

With a fixed energy charge and credit structure, the city anticipates paying a premium for the first 10 years of participation, followed by savings in future years. The city will use savings from a municipal energy conservation program to pay for the initial premium (City of Bellevue 2019).

Other local government purchasers: Anacortes, Bellingham, Issaquah, Kent, Kirkland, Lacey, Langley, Mercer Island, Olympia, Redmond, Snoqualmie, & Tumwater

# City Participation in Green Tariffs – Minneapolis

*Key elements that enabled the purchase:*

- *Volume of renewables*
- *Ability to offset the premium with other programs*

## Minneapolis, MN and Xcel Renewable Connect

The City is currently enrolled in two separate contracts in the Xcel Energy Renewable*Connect program, a 10-year contract for 17.8 million kWh annually (expiring in 2027) and a 5-year contract for 42.2 million kWh annually (expiring in 2023).

These contracts bring the amount of renewably derived electricity to 60% of the City's usage. The Renewable*Connect program provides Renewable Energy Credits to the City at a cost of $0.006/kWh to $0.008/kWh on top of the regular cost of the electricity from Xcel Energy. To offset the cost of participation, the city has used cost savings from its Community Solar Garden subscriptions.

# Innovative Products and Contracts

## Salt Lake City Community-Wide RE

- Salt Lake City Goal: 100% community-wide RE by 2030
- Developed 100% RE feasibility study
- Utah passed the *Community Renewable Energy Act*
  - allowing communities to opt-in to 100% RE offering; city customers can opt-out
- Developing the program with Rocky Mountain Power and other cities
  - under joint agreement with the utility
- Similar to community choice aggregation model, but utility is serving customers

## 24/7 RE Procurement

- Cities are considering 24/7 approaches.
- Google is working to match RE with load on an hourly basis annually to avoid reliance on fossil resources.
  - using diverse set of clean technologies that match loads
  - signing PPAs with storage
- Microsoft is using new approaches to manage financial risks of RE variability.
  - Volume Firming Agreements shift weather risks to third parties.
  - Proxy Generation PPAs shift operational risk to the generator.
  - Using these financial tools should create a demand for storage.

# Pace and Cost Considerations

- Pace of city RE procurement driven by:
  - city-approved targets
  - cost
  - procurement options
- Often city RE goals are staged:
  - first for municipal facilities
  - then for the community load
- Falling costs have increasingly made it attractive to buy RE ahead of goals.
- U.S. grid only has ~17% renewables (including hydro); long way to go to high penetrations of RE in most areas
- Early action yields more reductions in greenhouse gas (GHG) emissions.

Cities and large energy buyers that have already met their 100% RE goals:

- Aspen, Colo.; Burlington, Vt.; Georgetown, Tex.; Greensburg, Kan.; Kodiak Island, Ala.; and Rockport, Mo.
- Apple, Google, Lyft, Microsoft, Starbucks, Steelcase and Wells Fargo

Variety of approaches are used including:

- onsite installations
- offsite purchases (directly or through a local utility)
- unbundled REC purchases

# Accounting and Disclosure of 100% RE Products

Key issues:

1. Interaction between customer, utility, and state 100% clean energy goals
   - Utilities typically are not allowed to count customer RE purchases (e.g., green tariffs) toward their RPS targets, but 100% clean energy goals create challenges.
   - Customers may increasingly want to count RE in the utility grid mix toward their goals, rather than buying in addition to RPS.
   - Xcel and MidAmerican are retiring RECs procured for all customers (RPS or beyond RPS) on behalf of customers

2. How should utilities disclose RE sold to voluntary customers and report their emissions?
   - For accurate GHG reporting, customers need data on utility-specific generation mix
   - Data needs to have appropriate REC accounting addressing ownership of the renewable energy

# How Can Negative Impacts/Risks Be Mitigated?

## Customer Roles

- ***Using storage***
  - Storage can reduce or avoid distribution and bulk power systems impacts.
  - Customers can benefit from shaving peaks to reduce demand charges on bills.
- ***Flexing demand***
  - Customers with flexible loads can manage their demand levels to more closely match the timing of renewable generation on the grid or minimize utility system peaks.
- ***Grid-beneficial charging of electric vehicles***
  - EV loads for fleets or employee charging can be managed to align with solar/wind production.
- ***Matching demand on an hourly basis***
  - Matching purchases to loads minimizes grid impacts, but may have diminishing returns over all hours.
  - Using the grid for mismatches may be more cost-effective by taking advantage of differences in the timing across all customer loads, their load-shifting potential, and variations in regional RE production.

# How Can Negative Impacts/Risks Be Mitigated?

## Utility Roles

- ***Integrating customer renewable goals in planning***
  - Including voluntary renewable energy demand in integrated resource plans can enable utilities to identify integration challenges and needed system changes, and integrate demand in transmission planning.

- ***Adopting tariffs to encourage load response***
  - Utilities can add time- and location-based elements to electricity rates to send more accurate price signals to customers, which can cost-effectively shift loads to manage the variability of wind and solar resources.
  - Customers may be able to benefit from cost savings while helping the grid.

- ***Adopting programs or tariffs for distributed energy for renewable energy integration***
  - Utilities can enable customers to aggregate onsite distributed energy resources, such as onsite generation and storage, which can be dispatched to meet grid needs.

**Please use the chat box** to send us your questions and comments. You may want to direct your question to a specific presenter.

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