How Three Retail Buyers Sourced Large-Scale Solar Electricity

Making the Nation's Largest Non-Utility Solar Project East of the Mississippi a Reality

AMERICAN UNIVERSITY
WASHINGTON, DC

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

THE GEORGE WASHINGTON UNIVERSITY HOSPITAL

Customer First Renewables

U.S. EPA Green Power Partnership Webinar

October 7, 2014

Agenda

- Introduction (Gary Farha, CustomerFirst Renewables)
- Key Challenges & Barriers
- Solution Design & Implementation
  - Team (Meghan Chapple, The George Washington University)
  - Process (Chris O'Brien, American University)
  - Capabilities (Amy Mendoza, The George Washington University Hospital)
- Q & A

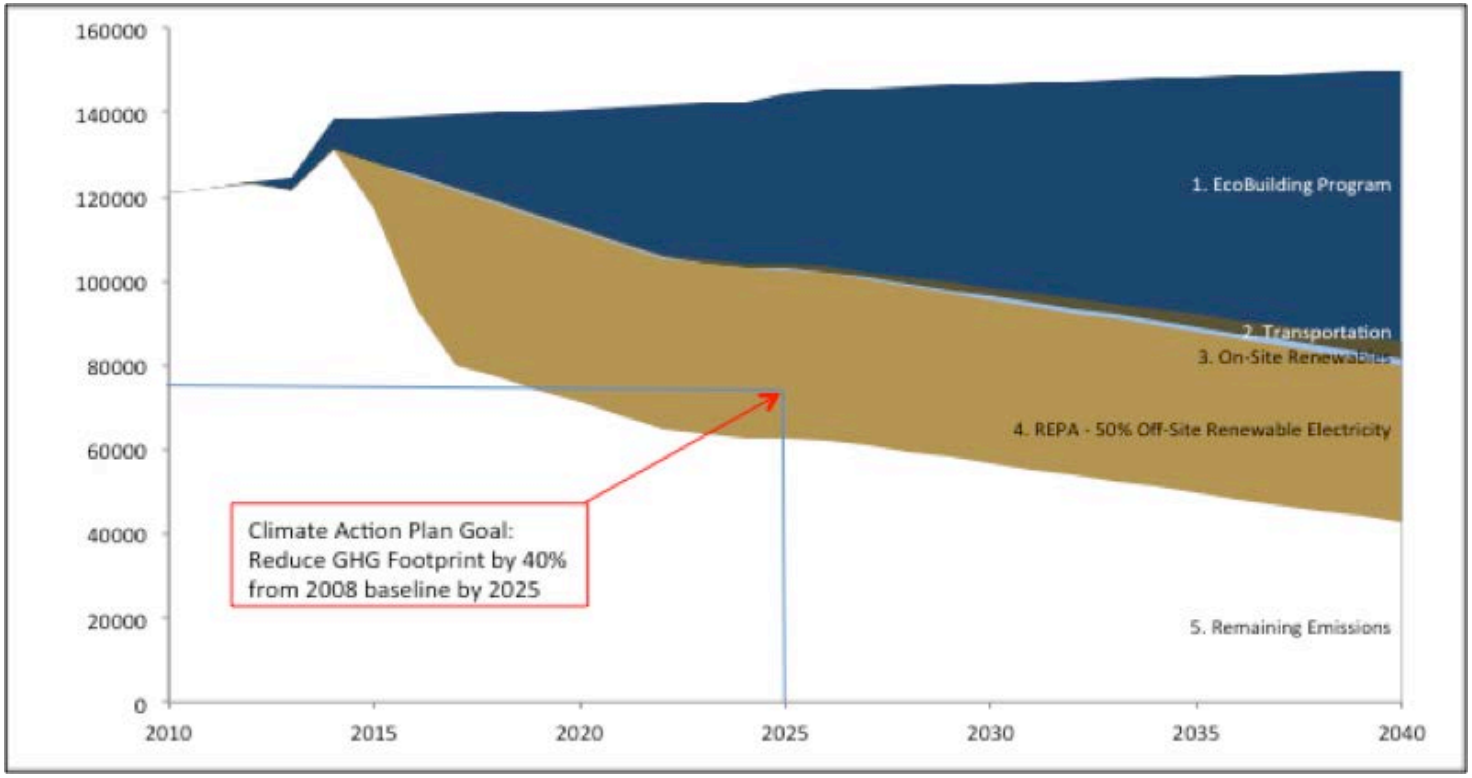
Project Overview

Buyers	• 2 major mid-Atlantic universities (GW and AU), both American College and University President's Climate Commitment (ACUPCC) signatories with aggressive GHG reduction goals • 1 major university-affiliated hospital (GWUH)
Their goals	• Meet commitments by establishing renewable energy (RE) solution to green fuel mix and mitigate future price uncertainty
Starting point	• Urban footprint, ~260,000 MWh combined use • Small on-site solar PV and solar thermal hot water • Located in deregulated market
Expected impact	• Supply 50% of each customer's needs from new RE project (30% for GWUH) • Reduce electricity-related GHG by 50% (30% for GWUH) • Significant NPV cost savings relative to forecasted conventional power rates • Largest non-utility solar project east of Mississippi
Process steps and time	• 2 year process between initial strategy and contract, supported end-to-end by CustomerFirst Renewables (CFR) • Competitive process with ~30 project bids, Duke Energy Renewables (DER) winner • First phase Commercial Operation Date (COD) 6 months after contract signing
Organization involvement	• Cross-functional team from the start, including facilities, sustainability, finance, procurement, legal and PR • Presidents and CFOs decision makers with Board input

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

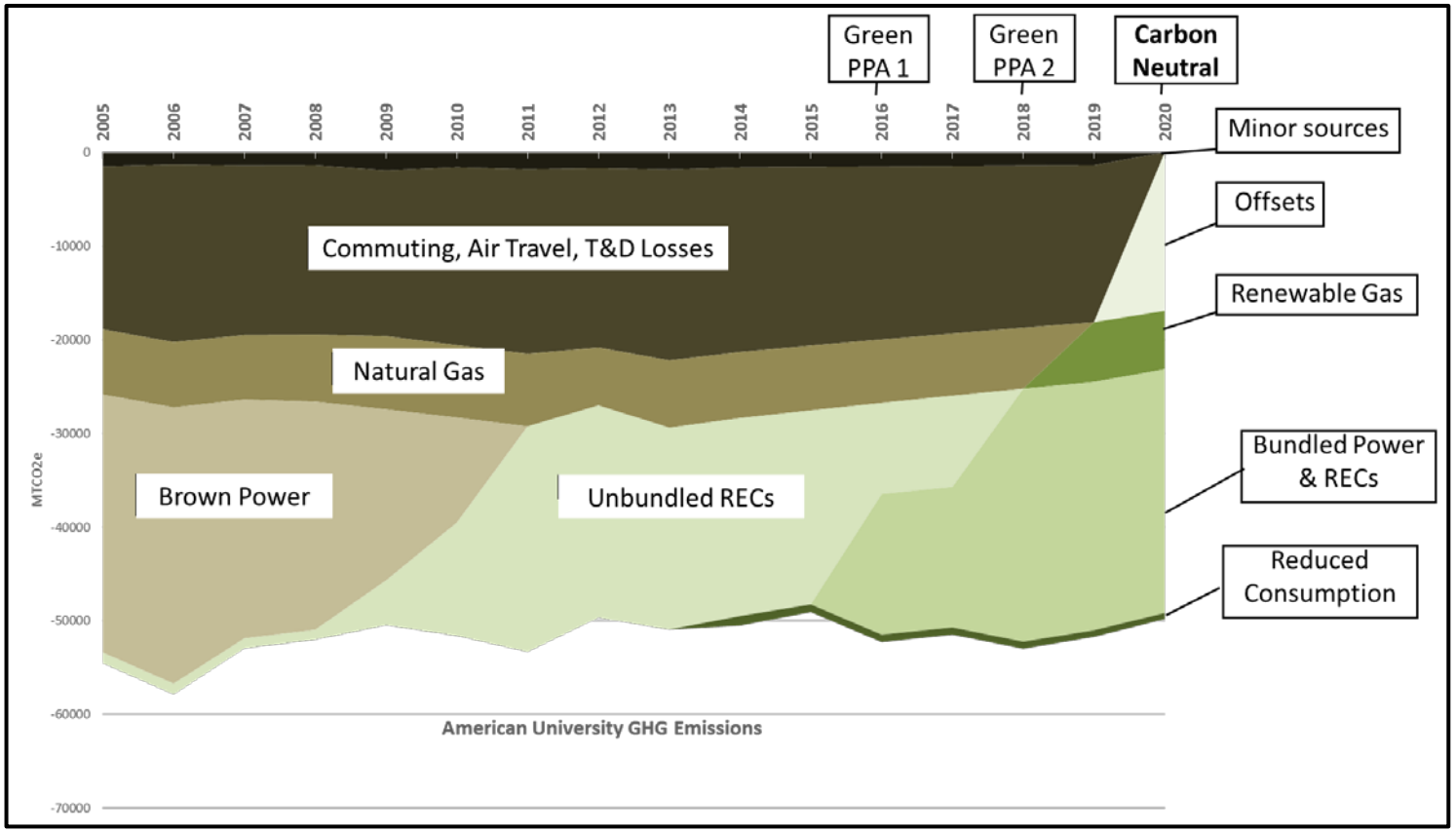
Meeting Our Goals - GW

GW Climate Neutrality Pathway



Meeting Our Goals - AU

AU Climate Neutrality Pathway



Meeting Our Goals - GWUH

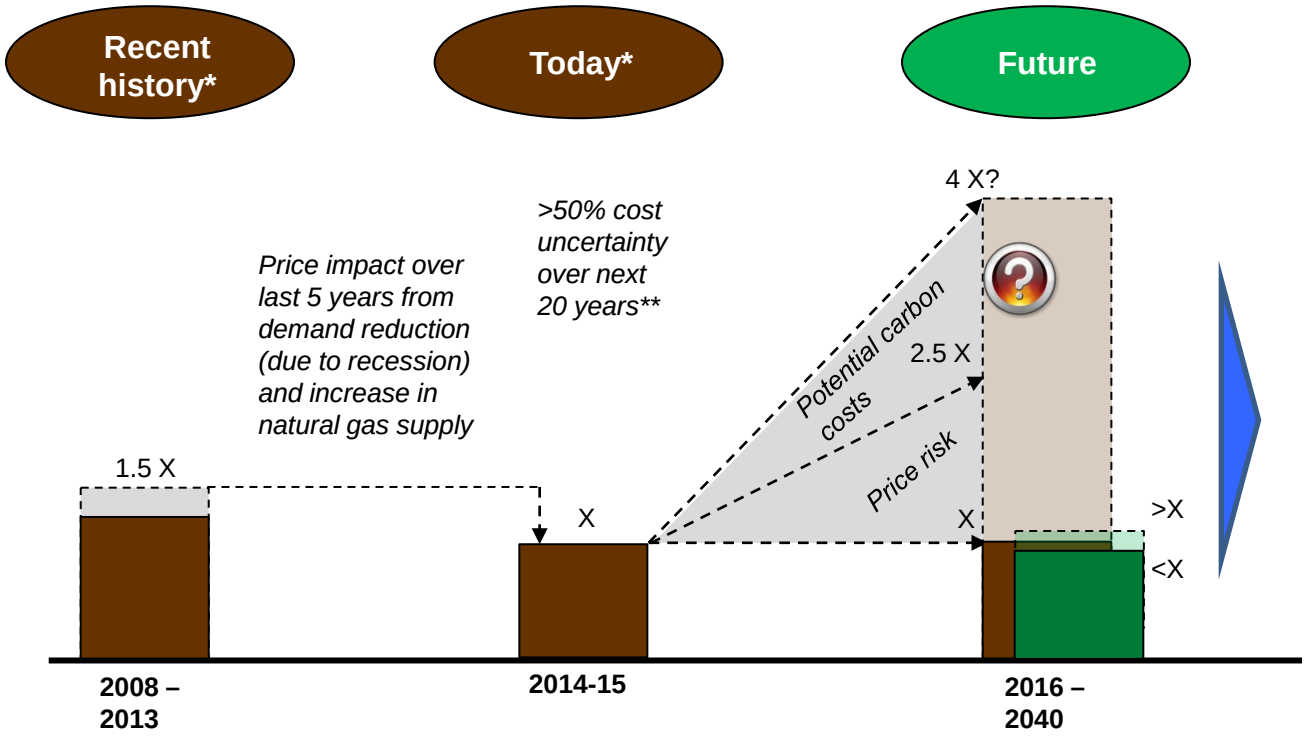
GWUH Sustainability Highlights

- Recently created an interdisciplinary Sustainability team with 6 areas of focus derived from the Heathy Hospitals Initiative:
  - Engaged leadership
  - Smarter purchasing
  - Healthier food
  - Safer chemicals
  - Less waste
  - Leaner energy
- Integral member of Sustainable DC Healthcare Sector workforce committee partnering to develop a District wide Healthcare sector pledge; drawn from the ACUPCC pledge
- Recently received the District of Columbia Hospital Association's Environment Excellence award for our work within the committee, inclusive of the Capital Solar Power Project.

Opportunity with Large Scale Renewables

Generation Portion of Electric Bill

$/MWh

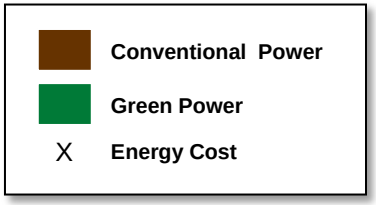


*Secure PPA for renewable solution****

- *20%+ cost savings potential relative to conventional power*
- *100% increase in price certainty*

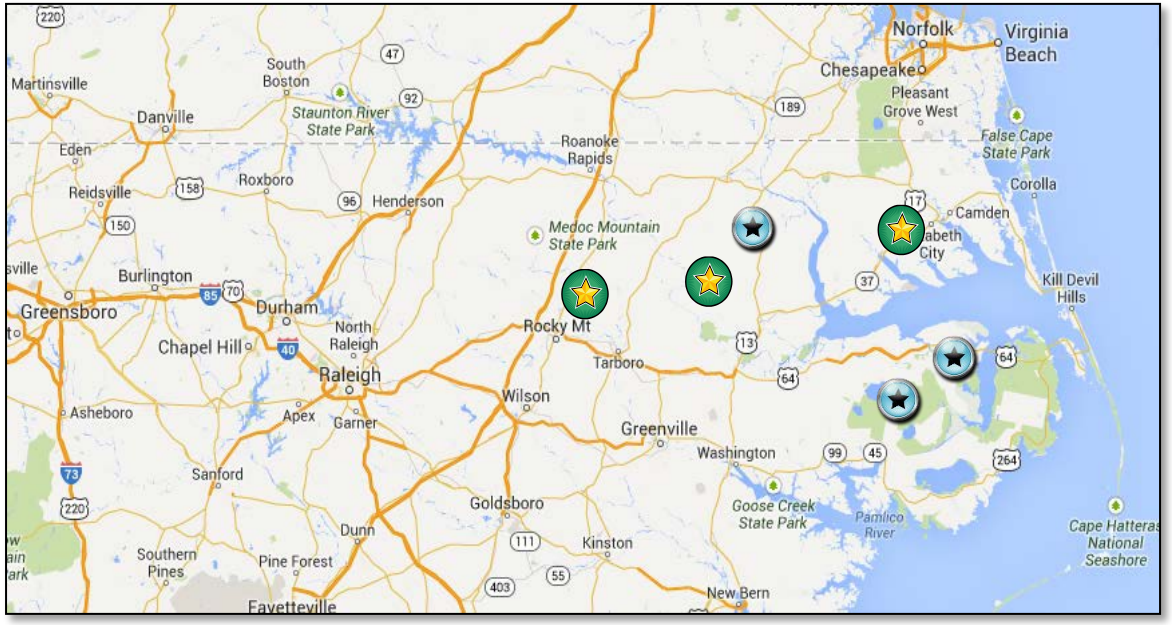
Key Success Factors

- Minimize PPA price at the renewable site
- Minimize cost and risk of moving power to facilities



* Purchase conventional power from traditional market suppliers.
** Assumes 0% to 5% nominal price escalation in future electricity prices over the next 20 years; excludes future cost of carbon.
*** Assumes renewable solution sized to deliver 50% of customer needs; NPV savings are estimated over 20 years.
Source: Customer records; 2013-14 procurement process; CFR analysis

NC Solar Project Sites



Selected Sites

Other Potential Sites

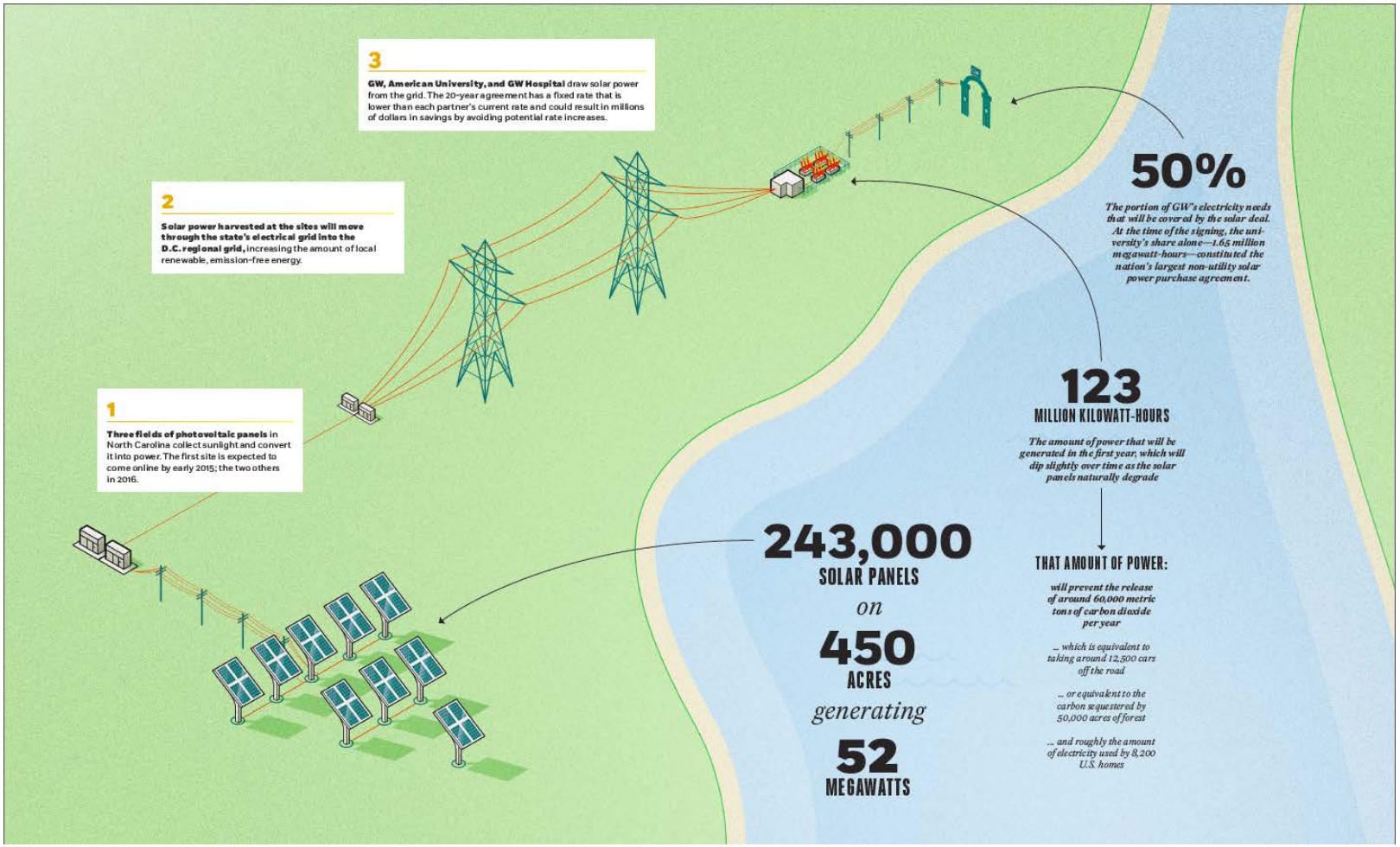
Illustrative Site Layout

Site A Layout
28 MWdc / 20 MWac

- Project will require 3 sites to produce 123,000 MWh in first full year of operation (52 MWac)
- Initial site under construction, COD 12/31/14
- Other two site locations to be finalized by 4/30/15, COD 12/31/15

Source: Capital Partners Solar Project

Direct Delivery Solution



Source: GW Magazine "Here Comes the Sun" (Pre-publication Sept 2014)

Key Challenges & Barriers

- Aligning **disparate views** of what defined success within and across organizations
- Overcoming a **lack of market transparency** on renewable market prices
- Needing to understand **all-in impact** on buyer economics, not just project cost
- Building **buyer understanding and confidence** in novel solution that pushed the envelope
- Designing and negotiating **innovative contract provisions** that addressed buyer sensitivities
- Committing to a solution and **long-term contract** for energy unlike what had been done before at each purchasing institution
- **Sustaining process momentum** alongside short-term, day-to-day responsibilities of each institution's operations

Agenda

- Introduction (Gary Farha, CustomerFirst Renewables)
- Key Challenges & Barriers
- Solution Design & Implementation
  - Team (Meghan Chapple, The George Washington University)
  - Process (Chris O'Brien, American University)
  - Capabilities (Amy Mendoza, The George Washington University Hospital)
- Q & A

How We Did It: Team

1. Established a **cross-functional team that owned process**
2. Involved **experienced, external support upfront** to run the process
3. Leveraged the **benefits of partnership** to build confidence to keep moving forward (i.e., “we are all in this together”)

Cross-Functional Team Established Within Each Buyer

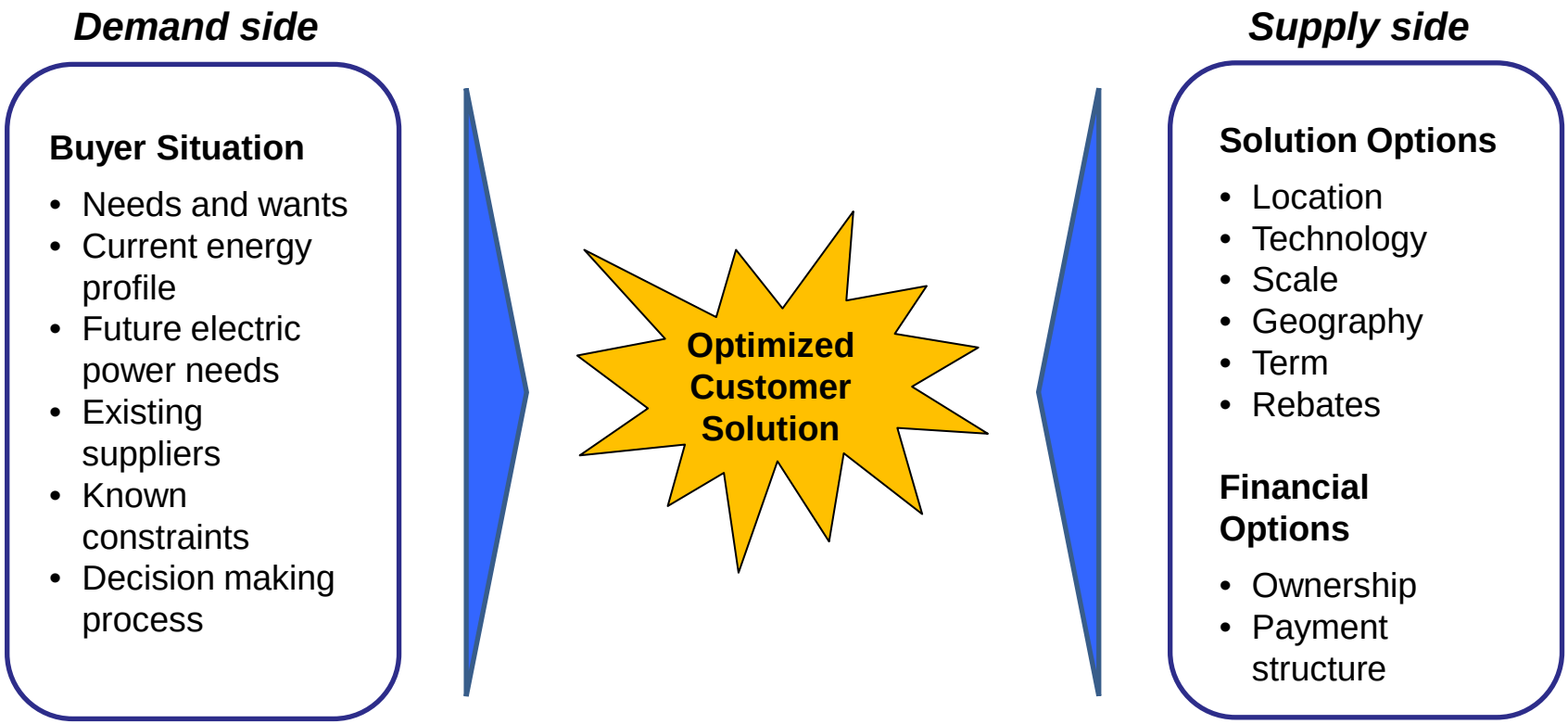
Parties Involved

- Board of Trustees
- President
- CFO/VP Finance & Admin
- Office of Sustainability
- Facilities & Utilities Management
- Planning & Administration
- Procurement & Purchasing
- Finance / Controller
- General & External Counsel
- Public Relations & Media Teams

Implication for Project Success

- Cross-functional team with intermittent involvement from many parties within each organization
- ~60 individuals involved in the project throughout its life cycle
- Requires consistent and dedicated support and core team to manage the process start to finish

External Support Helped Create Optimal Solution



How We Did It: Process

1. Established from Day 1 a **cross-functional team that owned process**
2. Involved **experienced, external support upfront** to run the process
3. Leveraged the **benefits of partnership** to build confidence to keep moving forward (i.e., “we are all in this together”)
4. Gained clear, upfront **agreement on what defined success**
5. Competed **more than one technology** to build confidence
6. Adapted **process and timeline** as new issues/challenges came up and problem solved our way through numerous “show stoppers”

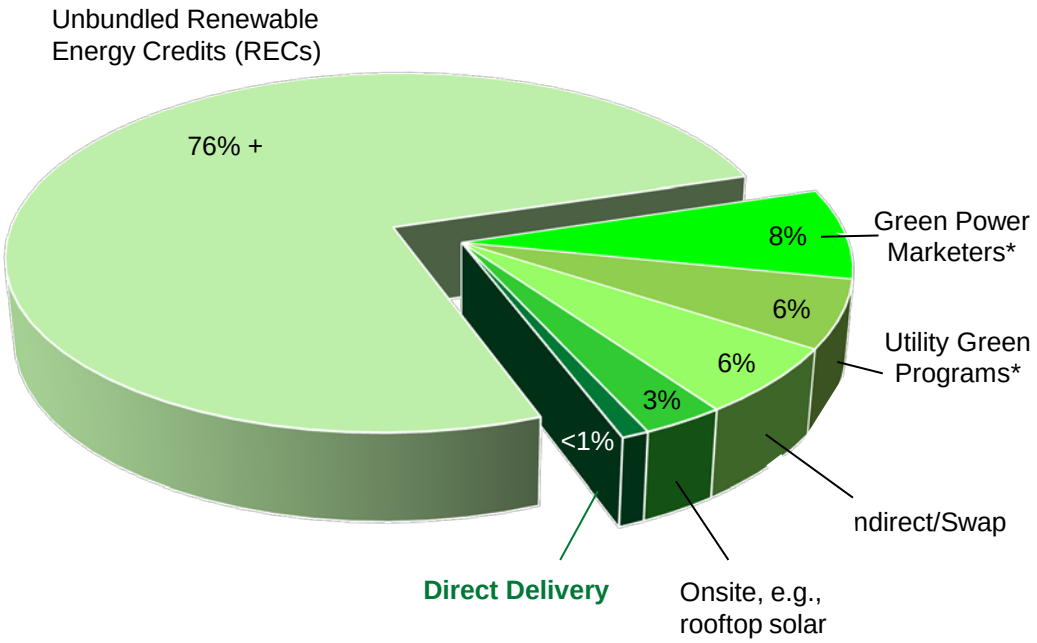
Solution Space Agreed to at Outset of Process

Buyers' Preferred Solution Space

Solution Element	Hypotheses
Location	❑ Preferably within PJM or another interconnected region ❑ Attractive long-term transmission access with manageable risks ❑ Solid local community support for project
Technology	❑ Large scale wind or solar with contemporary hardware ❑ Preferably new development, so customers can claim additionality
Scale	❑ Solution sized to serve ~one-half of current needs ❑ Sufficient project size to capture wind or solar farm economies of scale ❑ Partner with others to achieve scale benefits
Delivery	❑ Direct delivery to buyer's facilities ❑ RE supply complemented by firming resources to ensure reliable supply ❑ Buyers retain control over solution RECs
Term	❑ 20-year term with fixed price (flat or with nominal escalator escalator) ❑ Understand trade-offs with shorter-term contract
Ownership	❑ Prefer PPA with experienced and financially-strong developer/supplier
Value capture	❑ Project timing that allowed for full capture of PTC/ITC and other incentives ❑ Well-informed process that equips buyers to secure best economics – Current cost equal to or less than brown power + RECs – Significant reduction in future price uncertainty risk

Direct Delivery from Offsite Location is Novel

How Large Electricity Users Access Renewables



Green Power Marketer – an non-utility power supplier that sells green power in unregulated markets
Utility Green Program – a utility green-labeled product offering to ratepayers
Indirect/Swap – a product where the renewable power is sold into the grid and the related benefits are passed through to the PPA buyer (e.g., Google's wind farms in Iowa)

* In most cases RECs are bundled with conventional power supply.

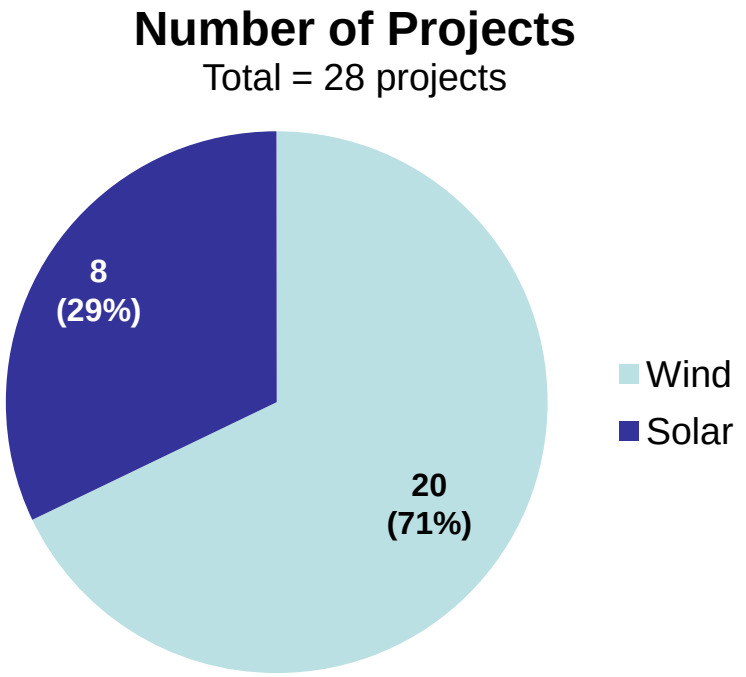
Source: NREL "Status and Trends in the US Voluntary Green Power Market", October 2013; EPA Green Power Partnership website, May 2014; CFR analysis

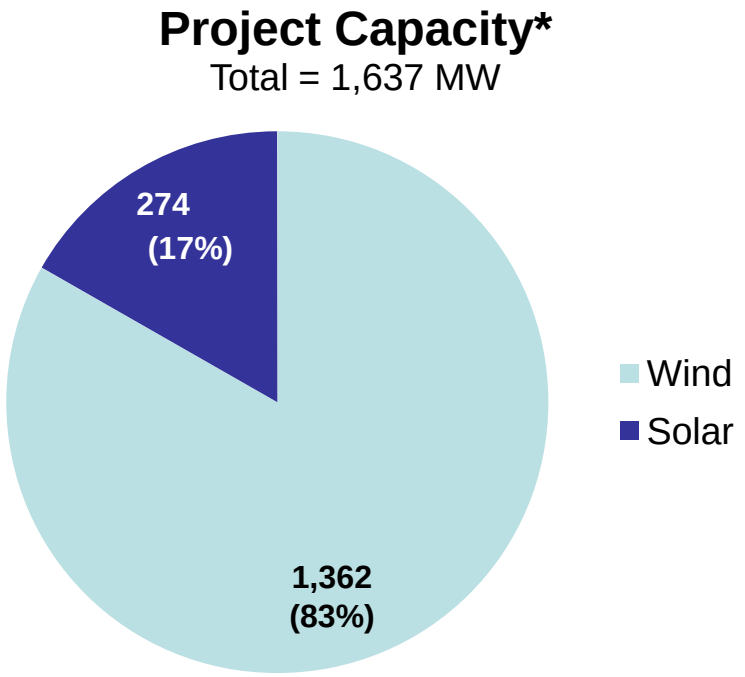
The large majority of renewable energy supplied today comes from unbundled RECs

For the subset of buyers that have long-term contracts with specific renewable projects, most are either indirect purchases where conventional power continues being supplied by the incumbent utility separate from the renewable benefits or onsite supply that meets a small part of total needs

The Capital Partners Solar Project approach created a new renewable project sourced through a competitive process that delivers the power via the regional transmission grid to each buyer; the end result is a solution optimized to minimize costs and risk, and maximize benefits

RFP Response

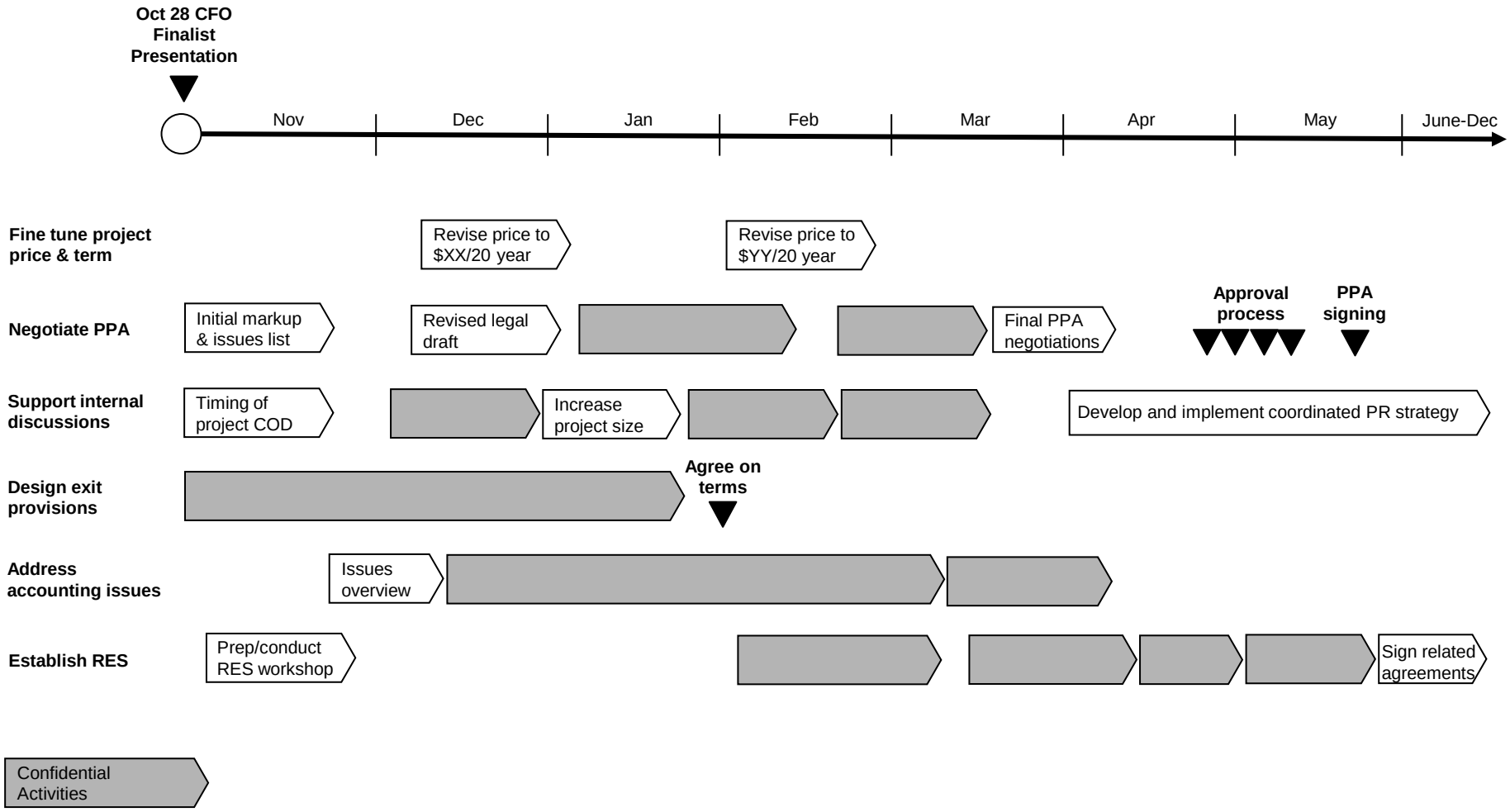




* Large wind projects above needs capped at 90 MW; numbers may not add due to rounding.

Source: Common responses to Buyer RFPs; CFR analysis

Project Timeline and Work Streams After Project Selection

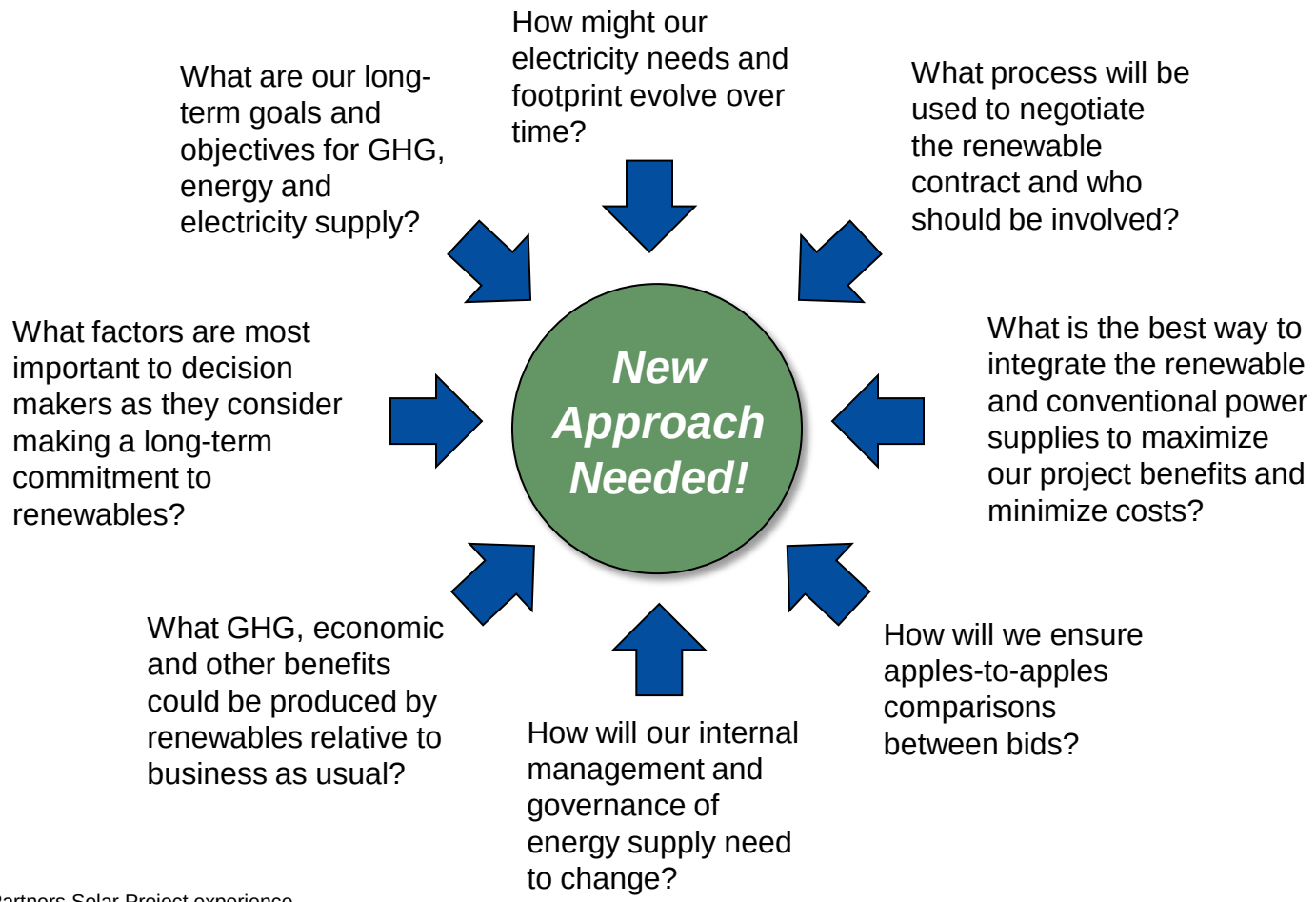


How We Did It: Capabilities

1. Established from Day 1 a **cross-functional team that owned process**
2. Involved **experienced, external support upfront** to run the process
3. Leveraged the **benefits of partnership** to build confidence to keep moving forward (i.e., “we are all in this together”)
4. Gained clear, up front **agreement on what defined success**
5. Competed **more than one technology** to build confidence
6. Adapted **process and timeline** as new issues/challenges came up and problem solved their way through numerous “show stoppers”
7. Recognized early on that this **wasn’t a standard RFP/procurement process** and we would be better off adopting a new approach
8. Utilized an extremely **objective, transparent and fact-based process** to guide top project selection and negotiations

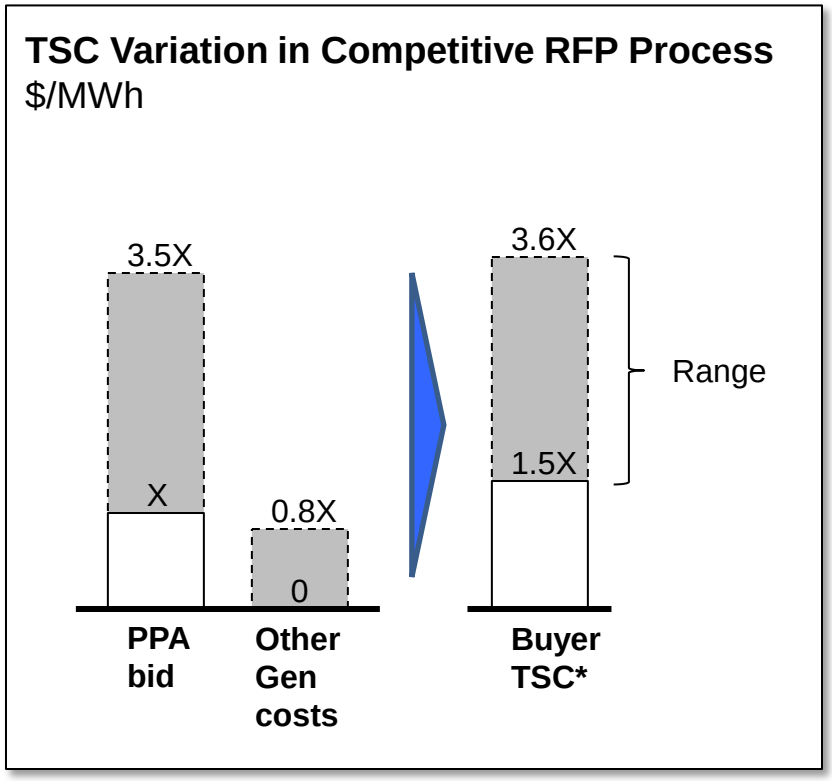
This is Not a Standard Procurement Process

Some of the questions we needed to answer



Source: Capital Partners Solar Project experience

Comparison of Total Solution Cost (TSC) and PPA Price



Approach helped buyers get the best value, not just the lowest PPA price

- Developers who bid were weighted and ranked on
  - Total solution cost (TSC)*
  - Financial strength & durability
  - Project characteristics and feasibility
  - Is it a new project (additive)?
  - Renewable project experience and management capacity
  - PPA duration and specific terms and conditions

* Includes all costs to deliver power to buyer sites including energy commodity, capacity, transmission and other costs; varies by renewable location, technology and other factors.

Source: CFR analysis

Agenda

- Introduction (Gary Farha, CustomerFirst Renewables)
- Key Challenges & Barriers
- Solution Design & Implementation
  - Team (Meghan Chapple, The George Washington University)
  - Process (Chris O'Brien, American University)
  - Capabilities (Amy Mendoza, The George Washington University Hospital)
- Q & A

Speaker Contacts

Thank You!

Meghan Chapple
Director, Office of Sustainability
mcb1@gwu.edu
(202) 994-7336

Chris O'Brien
Director, Office of Sustainability
cobrien@american.edu
(202) 885-2682

Amy Mendoza
Assistant Administrator
amyl.mendoza@gwu-hospital.com
(202) 715-4016

Gary Farha
President and CEO
gfarha@customerfirstrenewables.com
(202) 587-5789