

ALWAYS ON CAPACITY EXCHANGE (AOCE)

CONCEPTUAL INTRODUCTION AND PROPOSAL

JANUARY 23, 2020



RELIABLE ENERGY ANALYTICS LLC

ABOUT

- 14 years working at ISO New England
 - Software Architect for ISO-NE's Forward Capacity Market (FCM) Clearing Engine
 - Enterprise Architect working for Eugene Litvinov
 - Designed and Built ISO-NE's Business Intelligence and Advanced Data Analytics platform used by Market Monitoring and other departments, i.e. Risk Management
 - Deep technical knowledge of markets, functions, applications and data used by ISO-NE
- ANSI Meritorious Service Award recipient for development of Energy Industry Standards within NAESB
- Co-founder and Chief Technical Officer Group 8760 (www.8760.com)
- Responsible for the development of standards that are now part of the CFR ([NAESB EDM Title 18 § 284.12](#)) and [FERC operational standards \(eTariff\)](#)
- Extensive experience leading and participating in collaborative efforts among stakeholders in consensus based standards development initiatives (OASIS/UNCEFACT, NAESB, IEC, IETF, W3C)
- More information available here: <https://reliableenergyanalytics.com/>

PROPOSAL

Serve on behalf of the Massachusetts Attorney General Office Energy and Telecommunications Division to advocate for a capacity exchange marketplace, operated by ISO New England, that achieves Massachusetts Energy Targets by leveraging renewable capacity procurements by Massachusetts Companies, currently utilizing the Renewable Energy Buyers Alliance (REBA) Marketplace



AOCE OBJECTIVES

- Achieve Massachusetts Renewable Energy and Environmental Goals as a top priority, at the lowest consumer cost possible
- Provide a vibrant, 24x7, marketplace for qualified generating resource owners, green energy buyers and investors to establish capacity commitments, on their terms, which may be selected by ISO New England to receive capacity supply obligations and capacity payments to meet reliability requirements, while simultaneously achieving State Energy goals
- Eliminate the excessive over-buying of capacity that occurs today
- Give ISO-NE visibility into externalities that may result in over estimating capacity needs, leading to unnecessary and expensive consumer costs
- Ensure that we have a reliable electrical system for all, at a just and reasonable cost, in the quest for affordable clean energy, healthy communities, and climate protection

GREEN BUYER MOMENTUM IS STRONG



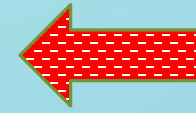
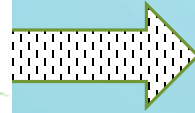
AOCE CONCEPTUAL DESIGN; CAPACITY COMMITMENTS

Capacity Sellers
receive qualification
for resources from
ISO-NE to place
offers in AOCE



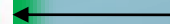
An AOCE matching engine
joins Bids/Offers resulting in a
Capacity Commitment (CC)

Capacity Sellers
place offers in AOCE,
backed by a qualified
Resource



Buyers place bids
in AOCE to secure capacity
and/or Energy, just like REBA
And Level 10 marketplaces

ISO-NE must
approve each CC
For feasibility



CC Buyers become
the Owners of ACC's

ISO approved CC results in an
Approved Capacity Commitment (ACC)



APPROVED CAPACITY COMMITMENTS (ACC)

- Each CC must be approved by ISO New England for both feasibility and adherence to market rules, creating an Approved Capacity Commitment (ACC). Failure to receive approval invalidates a CC and no contract is established
- An ACC is a tradeable object in AOCE
- An ACC containing terms to provide Energy Revenue to the ACC owner is similar to a Power Purchase Agreement
- REC ownership is also indicated in an ACC



CREATING A LARGE POOL OF CAPACITY COMMITMENTS

Goldman
Sachs

VISA



SAINT-GOBAIN

Raytheon

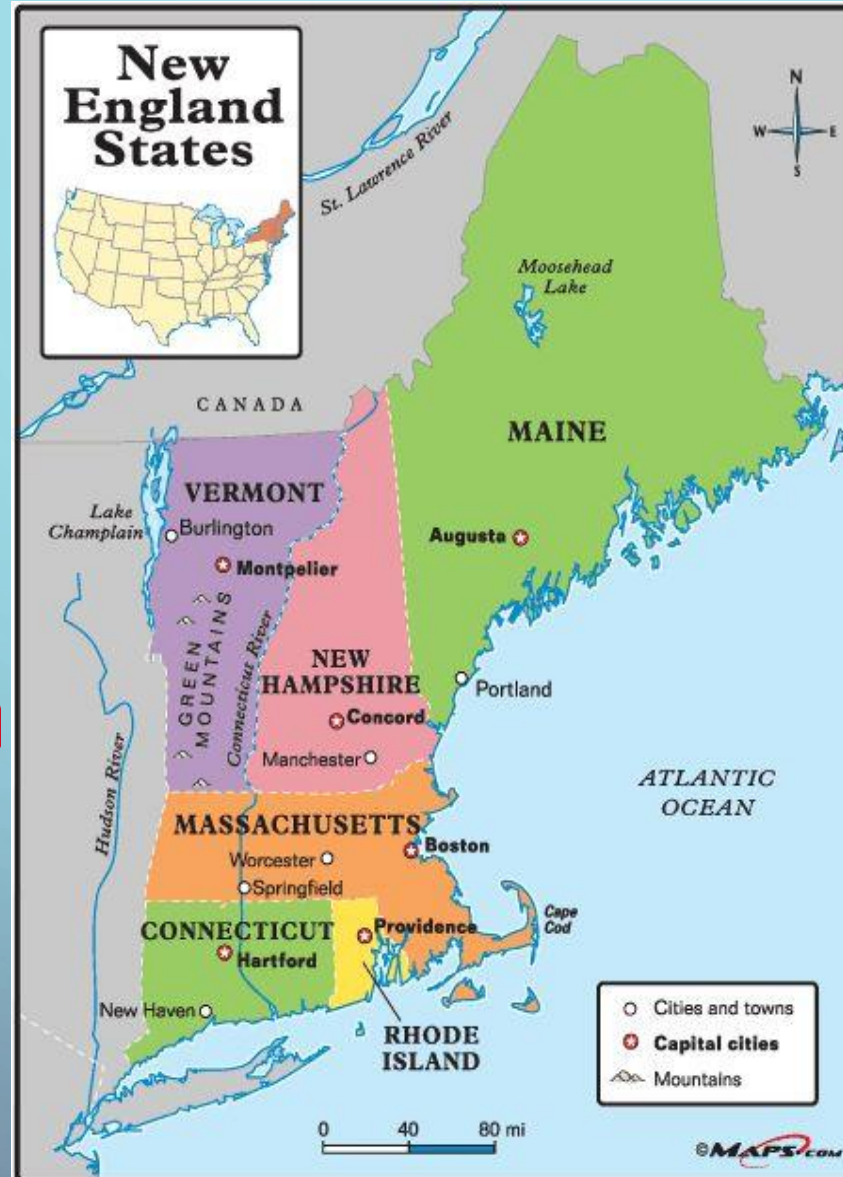
Johnson
Controls

NB
new balance

R

E

A



Akamai
FASTER FORWARD



Microsoft

facebook

EMC²

Walmart



PowerOptions
Powering Nonprofits

United
Technologies

sunrun

TECHNOLOGY AND FUEL NEUTRAL CAPACITY COMMITMENTS (MW) ACCUMULATE IN AOCE

Type	2020	2021	2022	2023	2024	2025
Solar	6,000	7,000	9,000	10,000	11,000	11,500
Nuclear	3,200	3,200	3,200	3,200	3,200	4,400
Wind	3,100	4,500	6,000	8,000	13,000	16,000
Hydro	3,100	3,500	3,900	4,300	4,700	5,100
TOTAL	15,400	18,200	22,100	25,500	31,900	37,000

All values are for example only and do not reflect actual data

CAPACITY SUPPLY OBLIGATIONS (CSO)

- At some point, based on *Market Rules*, the ISO must issue Capacity Supply Obligations (CSO) to Resource Owners to secure capacity for reliability purposes over a defined commitment period (CP), perhaps one year
- It's assumed that ISO-NE would announce its plan to secure specific quantities of capacity to meet States energy targets and capacity needed for reliability, well in advance of the CP
- ONLY resources with an ACC are eligible to receive a CSO in steps 1 and 2 of the issuance process



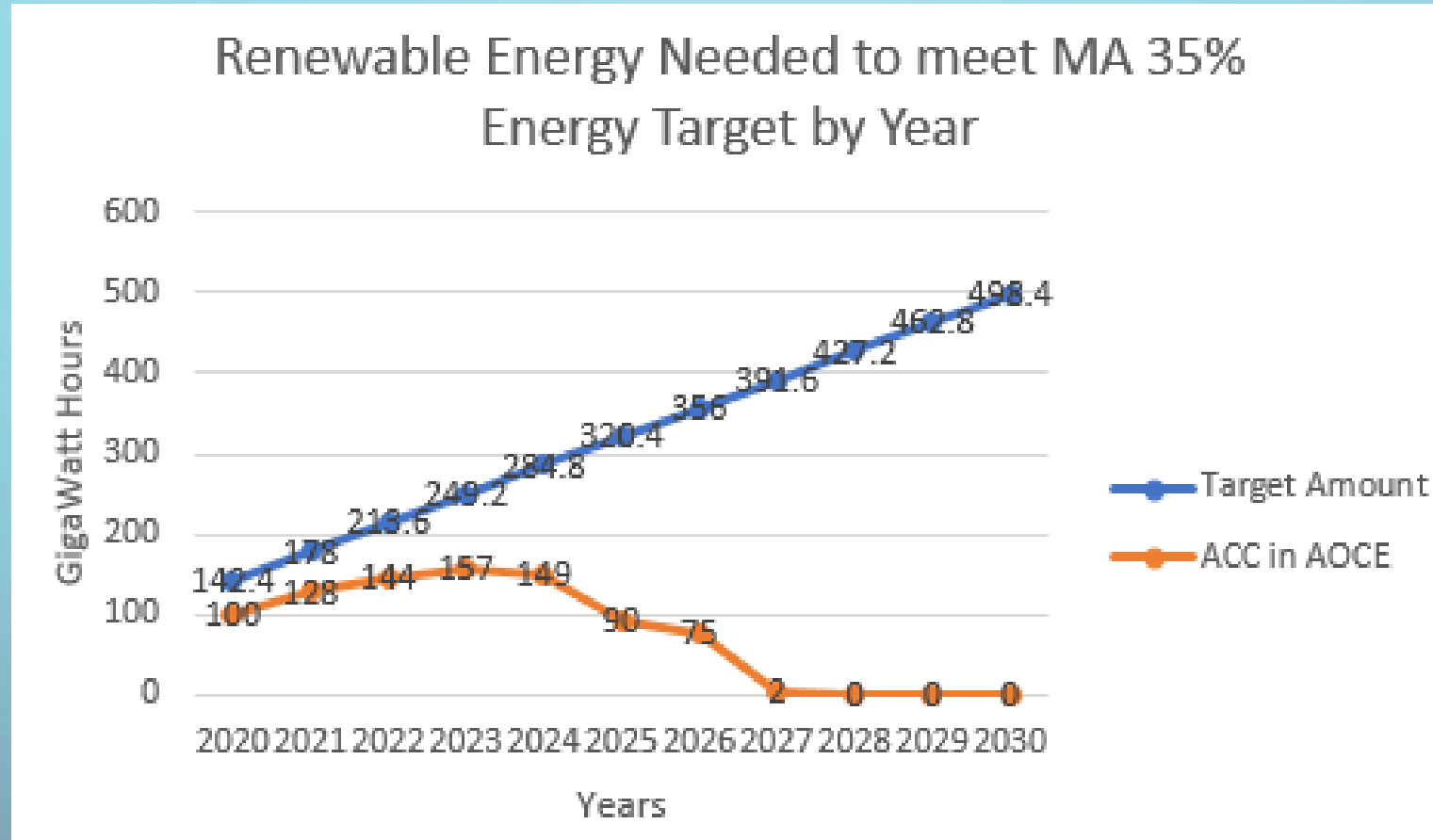
CSO ISSUANCE PROCESS (CSOIP)

- Market Rules determine when this process is executed
- The ISO will prioritize the issuance of CSO's for ACC's as follows:
 1. Satisfy State based energy targets using a lowest cost curve (like DA Energy market clears). State targets that are greater than the amount of ACC MW's available in ACOE will result in all ACC Resources receiving a CSO, provided there are no reliability issues in doing so.
 2. Satisfy Reliability Requirements by issuing CSO's to ACC resources in sufficient quantity, as determined by ISO New England, for reliability purposes in accordance with NERC standards and Market Rules, using a lowest cost curve (like DA Energy market clears)
 3. The ISO may refuse to issue a CSO to an ACC resource, based on reliability concerns
 4. One or more ISO Reliability Bid's (ISORB) may be placed into the AOCE by ISO New England to secure required capacity, if the ISO is unable to secure enough capacity to meet reliability requirements for the region, via steps 1 and 2

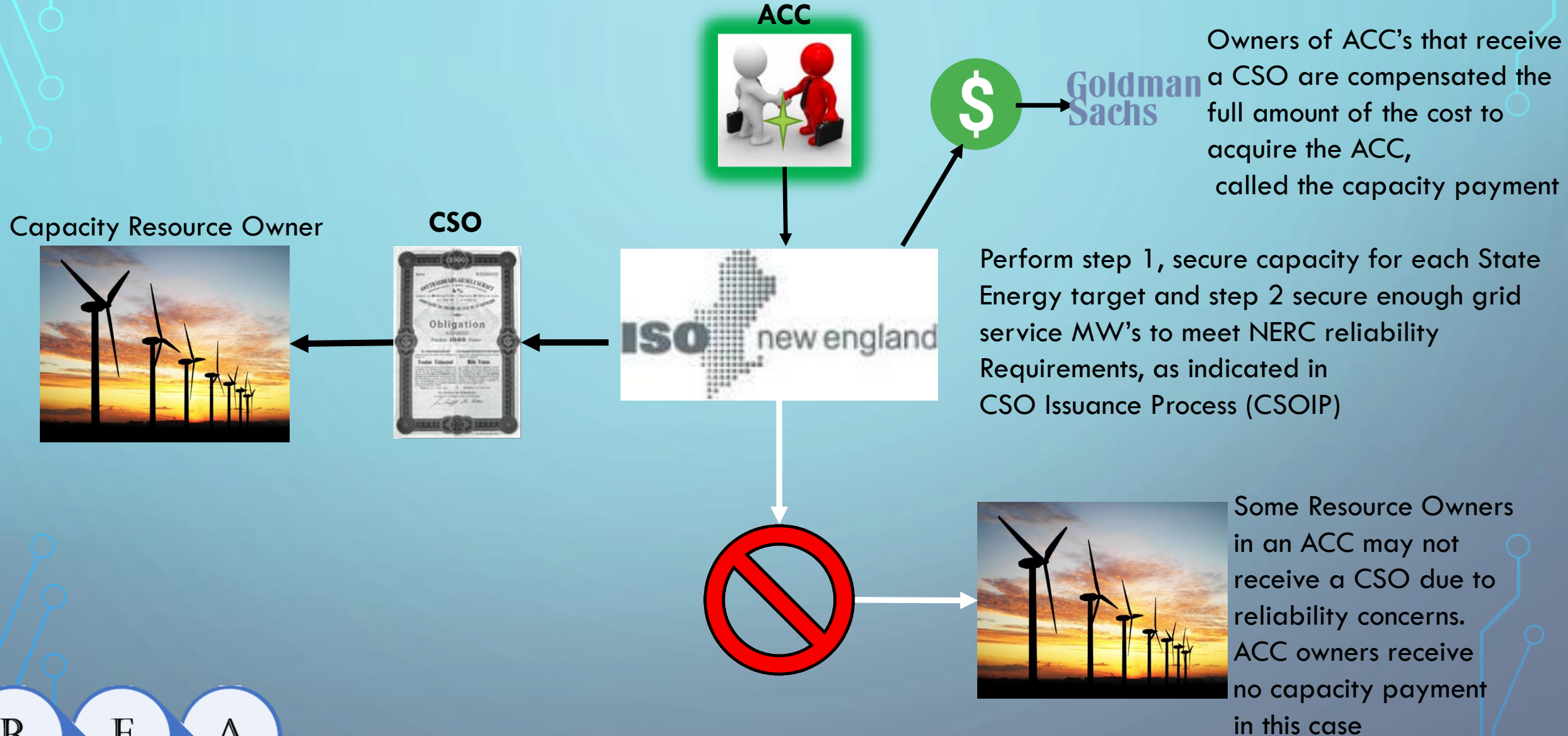
NOTE: During step 2, ISO New England may choose to acquire capacity for reliability based on the need for specific and essential grid services, ref: NERC guidelines for Grid Reliability Services, available here:

<https://www.nerc.com/comm/Other/essntlrbltysrvdstskfrcl/ERSTF%20Concept%20Paper.pdf>

STATE ENERGY TARGET PROCUREMENT EXAMPLE



CAPACITY SUPPLY OBLIGATIONS FROM ACC'S



R

E

A

OTHER AREAS THAT WOULD NEED TO BE ADDRESSED

- Solutions to address capacity shortfalls to meet State Energy Targets
- Solutions to address capacity shortfalls to meet ISO-NE/NERC reliability requirements for reliable grid operations
- Financial Assurance requirements
- Market Mitigation guidelines
- And many more details that have yet to be discovered, which would need to be specified in market rules



AOCE IS A CATALYST FOR OPEN DIALOGUE

- AOCE is not a “functional design”; it is a strawman concept from which to begin discussion among stakeholders
- AOCE aims to provide:
 - A transparent means for the ISO to secure capacity for reliability in accordance with State Energy Goals
 - Provide ISO-NE with visibility into externalities that may result in excess capacity procurement and unnecessary consumer costs
 - Provide NE consumers with the lowest possible capacity costs to achieve State Energy Goals and Reliable Grid operations
 - Provide generators with adequate funding to ensure they can safely and reliably generate the energy needed to power the NE States
 - Establish a robust and trustworthy capacity marketplace for all buyers, sellers and investors to achieve their objectives, under the watchful and independent eye of ISO-NE



EXAMPLE STATEMENT OF WORK

- Create technical and economic analysis comparing AOCE to other alternatives, i.e. FCEM and CASPR, which will be used for educational purposes
- Work with existing MA Green Buyers that are already REBA members to gather support for their participation in an ISO-NE operated AOCE
- Provide NEPOOL members with educational awareness of AOCE and existing Green Buyer capacity exchanges, like REBA and Level Ten Energy, emphasizing the benefits of the approach in achieving MA State Energy Goals
- Educate other entities that could influence ISO-NE, i.e. AIM
- Educate ISO New England on the details of how an AOCE works to create a market based solution to secure renewable and zero emission capacity to meet State Energy Goals, while also securing capacity for reliability purposes, at the lowest cost
- Represent the MASS AGO in NEPOOL meetings and other industry activities, i.e. conferences, symposiums, etc. where AOCE will be discussed/presented
 - May 12 & 13: Save the date! **New England Energy Conference and Exposition #NEECE20**, Sea Crest Beach Hotel in N Falmouth, MA. Sponsorship and exhibit opportunities will be announced shortly.
 - Podcast teed up with Energy Central for February

NEXT STEPS

- Present Formal Proposal and Statement of Work to MA AGO
- Go/NoGo decision by MA AGO to accept the proposal and move forward, or not
- REA is a registered entity with COMMBUYS, Vendor ID 42000

