



MARIN COUNTY | NAPA COUNTY | UNINCORPORATED CONTRA COSTA COUNTY | UNINCORPORATED SOLANO COUNTY  
BENICIA | CONCORD | DANVILLE | EL CERRITO | LAFAYETTE | MARTINEZ | MORAGA | OAKLEY | PINOLE  
PITTSBURG | PLEASANT HILL | RICHMOND | SAN PABLO | SAN RAMON | VALLEJO | WALNUT CREEK

Technical Committee Meeting  
Thursday, February 4, 2021  
8:30 A.M.

The Technical Committee Meeting will be conducted pursuant to the provisions of the Governor's [Executive Order](#) N-29-20 (March 17, 2020) which suspends certain requirements of the Ralph M. Brown Act. Technical Committee Members will be teleconferencing into the Technical Committee Meeting.

Members of the public who wish to observe the meeting may do so telephonically via the following teleconference call-in number and meeting ID:

Dial: 1-669-900-9128  
Meeting ID: 862 2771 8798  
Meeting Password: 142595

For Viewing Access Join Zoom Meeting:

<https://us02web.zoom.us/j/86227718798?pwd=aHEzcDZ1dlQrT3RSLzBkSTFvZjBJdz09>

Agenda Page 1 of 2

1. Roll Call/Quorum
2. Board Announcements (Discussion)
3. Public Open Time (Discussion)
4. Report from Chief Executive Officer (Discussion)
5. Consent Calendar (Discussion/Action)
  - C.1 Approval of 10.1.20 Meeting Minutes

## Agenda Page 2 of 2

6. Electing Chair of Technical Committee (Discussion/Action)
7. Green Hydrogen Pilot Project (Discussion)
8. Biomass Overview Presentation (Discussion)
9. Committee Matters & Staff Matters (Discussion)
10. Adjourn

DISABLED ACCOMMODATION: If you are a person with a disability which requires an accommodation, or an alternative format, please contact the Clerk of the Board at (925) 378-6732 as soon as possible to ensure arrangements for accommodation.

**DRAFT**

**MCE TECHNICAL COMMITTEE MEETING MINUTES**  
**Thursday, October 1, 2020**  
**8:30 A.M.**

The Technical Committee Meeting was conducted pursuant to the provisions of the Governor's [Executive Order](#) N-29-20 (March 17, 2020) which suspends certain requirements of the Ralph M. Brown Act. Committee Members, staff and members of the public were able to participate in the Committee Meeting via teleconference.

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**Present:** John Gioia, County of Contra Costa  
Ford Greene, Town of San Anselmo  
Kevin Haroff, City of Larkspur  
David Kunhardt, Town of Corte Madera  
Greg Lyman, City of El Cerrito  
Kate Sears, Committee Chair, County of Marin  
Justin Wedel, City of Walnut Creek  
Ray Withy, City of Sausalito and the City of Mill Valley

**Absent:** Scott Perkins, City of San Ramon  
Rob Schroder, City of Martinez

**Staff  
& Others:** Jessica Brooks, Assistant Board Clerk  
Jenna Famular, Marketing & Communications Manager  
CB Hall, Senior Power Procurement Manager  
Darlene Jackson, Board Clerk  
Vicken Kasarjian, Chief Operating Officer  
Sol Phua, Administrative Services Assistant  
Evelyn Reyes, Administrative Services Assistant  
Dawn Weisz, Chief Executive Officer

**1. Roll Call**

Chair Sears called the regular Technical Committee meeting to order at 8:32 a.m. with quorum established by roll call.

**2. Board Announcements (Discussion)**

There were none.

**3. Public Open Time (Discussion)**

There were no speakers.

**DRAFT****4. Report from Chief Executive Officer (Discussion)**

CEO, Dawn Weisz, reported the following:

- The City of Vallejo will agendaize assignment of an MCE Board Representative at their October 13, 2020 City Council Meeting.
- New communities: conducting economic analysis for Fairfield to join and that item will be brought to the November Board meeting.
- MCE continues offering free charging at our San Rafael parking lot.
- Multi-year resource adequacy transactions are being prepared for 2021 and 2022 with NRG and Direct Energy, with the possibility of additional transactions with PG&E and So-Cal Edison.
- Joint procurement partnership with other CCAs to form a Super JPA will be brought to the November Board meeting.

**5. Consent Calendar (Discussion/Action)**

C.1 Approval of 9.3.20 Meeting Minutes

C.2 First Amendment to the First Agreement by and between MCE and Pioneer Solutions

Chair Sears opened the public comment period and there were no comments.

Action: It was M/S/C (Lyman/Greene) **to approve Consent Calendar items C.1 and C.2.** Motion carried by unanimous roll call vote. (Absent: Directors Perkins and Schroder).

**6. MCE 2021 Operational Integrated Resource Plan (Discussion/Action)**

CB Hall, Senior Power Procurement Manager and Jenna Famular, Marketing & Communications Manager, presented this item and addressed questions from Committee members.

Chair Sears opened the public comment period and there were comments from members of the public Houdy Goudey, Dan Segedin, and Ken Strong.

Action: It was M/S/C (Haroff/Kunhardt) **to approve MCE's 2021 Operational Integrated Resource Plan.** Motion carried by unanimous roll call vote. (Absent: Directors Perkins and Schroder).

**7. Committee & Staff Matters (Discussion)****8. Adjournment**

Chair Sears adjourned the meeting at 10:08 a.m. to the next scheduled Technical Committee Meeting on November 5, 2020.

**DRAFT**

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Kathrin Sears, Chair

Attest:

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Dawn Weisz, Secretary



## MCE Technical Committee Overview and Scope

Current Membership: 7

Current Members: TBD (Chair)  
 John Gioia, County of Contra Costa  
 Ford Greene, Town of San Anselmo  
 Kevin Haroff, City of Larkspur  
 David Kunhardt, Town of Corte Madera  
 Katy Miessner, City of Vallejo  
 Scott Perkins, City of San Ramon  
 Rob Schroder, City of Martinez

Membership Process: MCE strives to assemble a Technical Committee comprised of at least one county representative and one city/town representative from each county in the MCE service area. Available seats on the Technical Committee are therefore first offered to any interested and applicable Board member whose county is not yet represented by one county and one city member. Interested members can be added at a meeting of the Board when "New Committee Members" is on the Agenda.

Current meeting date: First Thursday of each month at 8:30 am

### Scope

The scope of the MCE Technical Committee is to explore, discuss and provide direction or approval on issues related to electricity supply, distributed generation, greenhouse gas emissions, energy efficiency, procurement risk management and other topics of a technical nature.

Frequent topics include electricity generation technology and procurement, greenhouse gas accounting and reporting, energy efficiency programs and technology, energy storage technology, net energy metering tariff, local solar rebates, electric vehicle programs and technology, Feed-in Tariff activity and other local development, Light Green, Deep Green and Local Sol power content planning, long term integrated resource planning, regulatory compliance, MCE's Energy Risk Management Policy (ERMP), procurement risk oversight, and other activity related to the energy sector. The MCE Technical Committee reviews and discusses new technologies and potential application by MCE.

## **Authority of Technical Committee**

- Approval of and changes to MCE's Net Energy Metering Tariff
- Approval of and changes to MCE's Feed in Tariff
- Approval of annual GHG emissions level and related reporting
- Approval of MCE procurement pursuant to Resolution 2018-03 or its successor
- Approval of MCE procurement-related certifications and reporting, including the Power Content Label
- Approval of contracts with vendors for technical programs or services, energy efficiency program or services and procurement functions or services Approval of power purchase agreements
- Approval of adjustments to power supply product offerings
- Approval of the Integrated Resource Plan
- Receipt of reports from the Risk Oversight Committee (ROC) on at least a quarterly basis regarding the ROC's meetings, deliberations, and any other areas of concern
- Initiation of and oversight of a review of the implementation of the ERMP as necessary
- Approval of substantive changes to MCE's Energy Risk Management Policy (ERMP), including periodic review of the ERPM and periodic review of ERPM implementation

## MCE Board Offices and Committees

### **Board Offices:**

Tom Butt, Chair  
Shanelle Scales-Preston, Vice Chair  
Garth Salisbury, Treasurer  
Vicken Kasarjian, Deputy Treasurer  
Dawn Weisz, Secretary

### **Executive Committee**

1. Tom Butt, Chair
2. Denise Athas
3. Edi Birsan
4. Barbara Coler
5. Ford Greene
6. Kevin Haroff
7. Shanelle Scales-Preston
8. Sally Wilkinson

### **Technical Committee**

1. Kevin Haroff (*Willing to take on role of Chair*)
2. John Gioia
3. Ford Greene
4. David Kunhardt
5. Katy Miessner
6. Scott Perkins
7. Rob Schroder

### **Ad Hoc Contracts Committee – 2021**

1. Ford Greene
2. Kevin Haroff
3. Scott Perkins

### **Ad Hoc Audit Committee - 2021**

1. Kevin Haroff

### **Ad Hoc Bonding Committee – 2021**

1. Edi Birsan
2. Ford Greene
3. Kevin Haroff
4. Sally Wilkinson





# Green Hydrogen Procurement Overview

MCE Technical Committee – February 4, 2021

# What is Hydrogen (H<sub>2</sub>)?

## Overview

- Gas that is tasteless, odorless and colorless
- Pure H<sub>2</sub> is scarce, but most abundant element in universe found in other molecules
- H<sub>2</sub> can be manufactured by splitting CH<sub>4</sub> (methane) or H<sub>2</sub>O (water) and stored in tanks

## Benefits

- H<sub>2</sub> can be produced from a diverse set of sources and processes without GHG emissions
  - Renewable-powered electrolysis can split H<sub>2</sub>O into O<sub>2</sub> and H<sub>2</sub> ("green hydrogen")
  - 95% of H<sub>2</sub> in US today is produced through natural gas reforming ("blue hydrogen" if CO<sub>2</sub> is captured/stored or "grey hydrogen" if CO<sub>2</sub> is emitted)
- H<sub>2</sub> can be stored in large quantities and used for power generation as well as transportation, feedstock for chemicals/materials, and industrial applications
- **MCE Goal:** Procure green hydrogen pilot project that converts renewable power → stored H<sub>2</sub> → dispatchable, long-duration power from fuel cell to grid

## Limitations

- Low efficiency relative to other fuels and limited infrastructure for transporting H<sub>2</sub>
- Not cost competitive and H<sub>2</sub> power generation capacity isn't widely available on a large scale

# H2 Applications

## H2 Uses Today\*

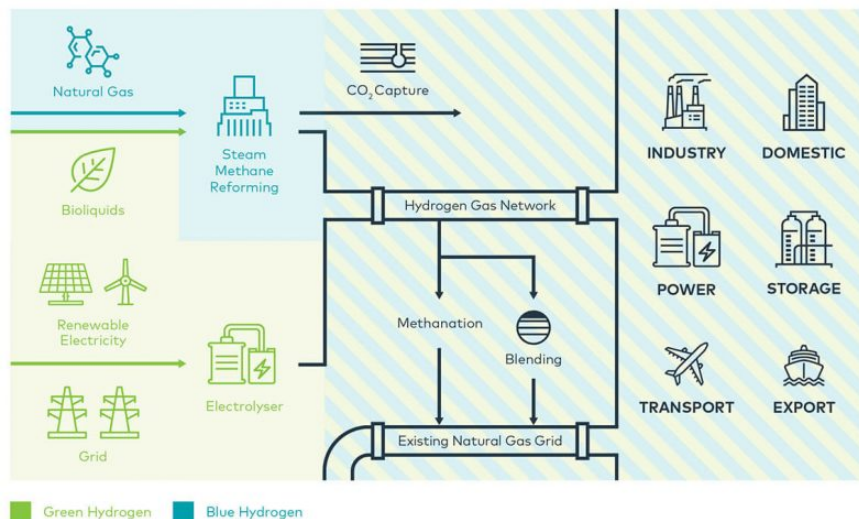
- 55% used for ammonia synthesis (fertilizer)
- 25% use in oil refineries for processing crude
- 10% used in methanol production
- 10% other

## H2 Uses in Power

- Can be blended with CH<sub>4</sub> for traditional natural gas applications
- MCE Use Case: Can be used to power fuel cells for 100% clean electricity

## H2 Uses in Transportation

- Fuel cell vehicles (light-, medium- and heavy-duty), aircraft, maritime, and trains





# Green H2 Power Project Examples in US

## H2 → Power Project Examples

### Intermountain Power Project (Utah)

- 1,800 MW coal plant being converted to 840 MW gas plant capable of utilizing H<sub>2</sub> / natural gas blend
- 30% H<sub>2</sub> blend on day one of operations (2025) and 100% H<sub>2</sub> by 2045
- Contracted to deliver electricity to LADWP



### NextEra Okeechobee Pilot (Florida)

- 20 MW electrolyzer powered by existing 80 MW solar array to fuel existing Okeechobee gas plant with H<sub>2</sub> / gas blend
- 2023 COD



### Stone Edge Farm (Sonoma, CA)

- Microgrid powered by solar, batteries, 400 kW electrolyzer and 28 kW H<sub>2</sub> fuel cell
- Came online in 2018



# MCE Desired H2 Procurement

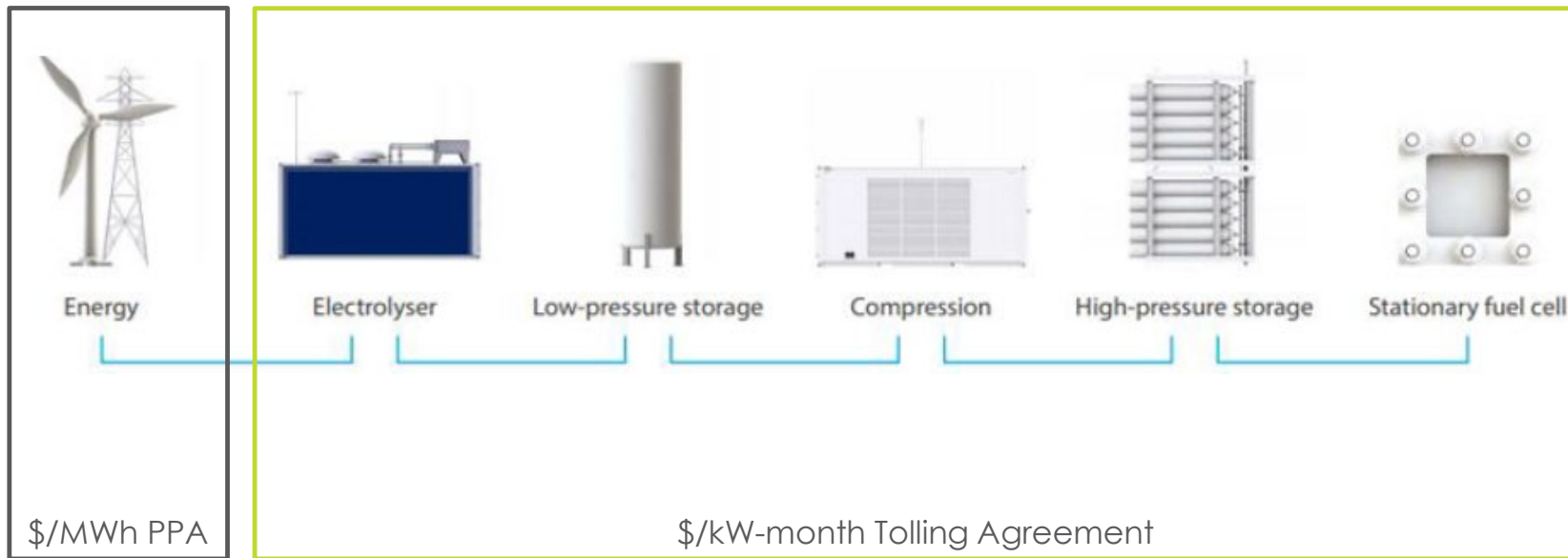
## Products Solicited

- **Dispatchable Energy** – renewables can charge electrolyzer during low/negative-priced hours and fuel cell can be discharged into the grid 24/7 during high-priced hours to optimize MCE's energy portfolio
- **Clean Resource Adequacy (RA)** – renewables and fuel cell provide additional RA to meet MCE's 50% by 2030 clean RA goal
- **Renewable Energy**– renewables and fuel cell will generate additional renewable energy for MCE to meet its compliance/internal RPS goals
- **Long duration storage** – renewables produce H2 as a form of long duration storage (4+ hours) to flexibly meet peak needs

## Project Specifications

- Must be 100% green product (fuel cell will only charge from renewables and not grid power)
- Preference for projects located in MCE's service territory
- Preference for projects that can provide microgrid and resiliency services during PSPS events

# Technology Overview and Offtake Structure



# Procurement Status

## **Background**

- MCE issued Clean RA RFO in Q2 2020 signaling MCE's interest for clean RA technologies such as green H2
- Began soliciting offers bilaterally in August 2020; signed multiple term sheets to commence project diligence with counterparties
- Proposals have been received for projects in MCE's service area
- Offer variations received vary on electrolyzer sizing, storage duration and fuel cell use case

## **Next Steps**

- Evaluation of offer variations to goal seek for maximum project value
- Confirm projects can participate in CAISO under market and interconnection rules
- Support counterparties applications for grants and incentive funding
- Move into exclusivity and formal contract negotiations with counterparties upon completing term sheet phase
- Continue solicitation and evaluation of offers from new counterparties

# Thank You

Lewis Bichkoff  
Power Procurement Manager  
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# Overview - Biomass Energy

MCE Technical Committee – February 4, 2020

# Biomass Energy 101

## **Biomass to Electricity**

Organic materials are burned to create heat, which creates steam that turns a turbine to generate electricity

## **Fuel**

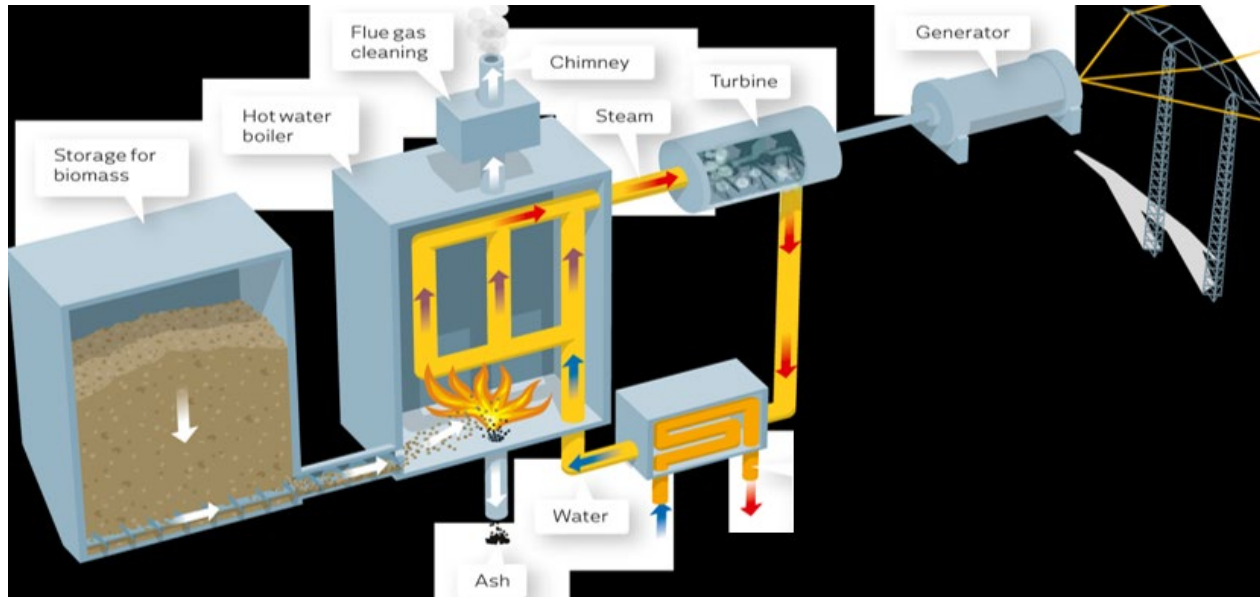
- Typically includes wood and agricultural waste like clean scrap lumber, forest debris and agricultural bi-products (rice hulls, wheat straw, etc.)
- Most fuels would otherwise be dumped in landfills, openly burned, or left as fodder for forest fires

## **Biomass vs Landfill Gas/Methane Capture**

- Biomass – Direct burning of organic material
- Landfill Gas – Decomposing organic material produces methane gas. Gas is captured and burned.

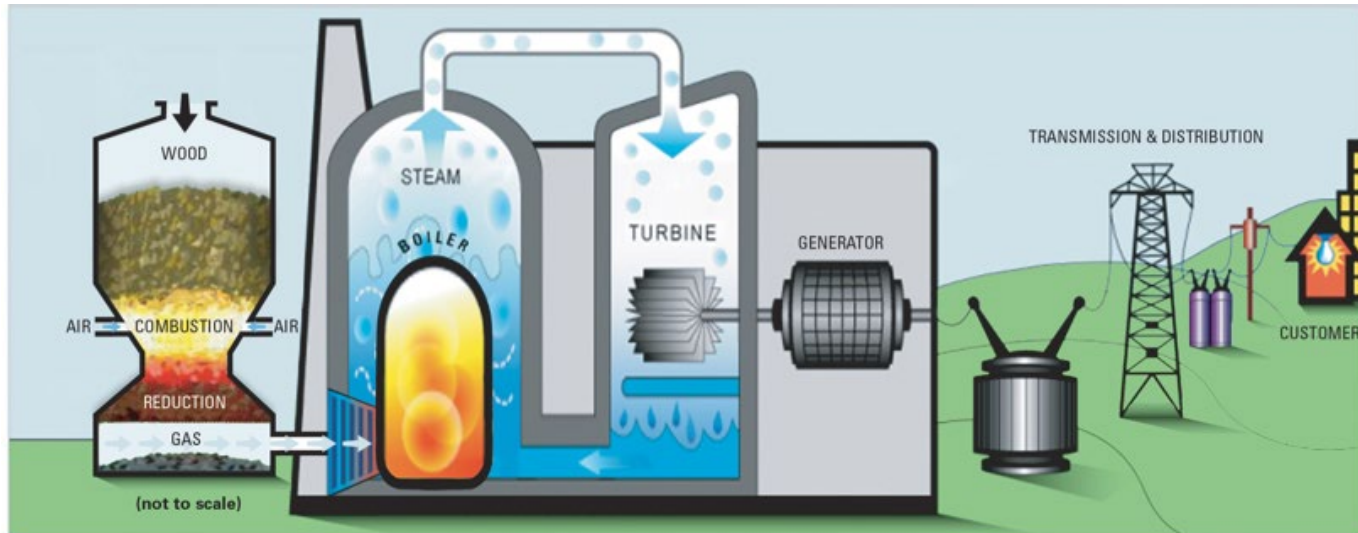
# Generation Technology

**Traditional Combustion** – Fuel is burned to create steam



# Generation Technology

**Gasification** – Fuel is heated at very high temperature in an oxygen deprived environment to produce a gas, which is then burned to create the steam. This process results in lower emissions than traditional combustion.





# Biomass Energy 101

## Energy Shape

- Baseload resource running at a fixed and flat output 24/7

## Renewable Energy

- Meets CA Renewable Portfolio Standard. Considered Product Category 1 (PCC1)
- Similar to Geothermal and Biogas, questions exist regarding how greenhouse gasses (GHG) will be calculated and the impact to MCE's Power Content Label (PCL)
- CA Energy Commission (CEC) is still developing the calculator to determine the emissions impact

# Biomass Energy Projects

## **MCE's Current Biomass Contracts**

- One short-term contract (2021) for energy from a facility in Williams (North of Sacramento)

## **Biomass Facilities in California**

- 21 operating / 12 Idle, but functional
- 4 within 100-mile radius of MCE service territory
- No existing facilities within service territory, but 3 are proposed
  - Napa Recycling and Compost Facility
  - Marin Sanitary Service
  - Fairfield

# Biomass Energy vs Solar & Wind

## Baseload vs Intermittent Energy Resources

- Biomass plants run round the clock, have a predictable output and are only limited by the availability of fuel
- Solar and wind run intermittently and are highly dependent on the weather

## Energy Cost & Revenue Streams

- In general, the net cost for Biomass is higher than solar+storage or wind (revenue-cost)
- Biomass provides a much more valuable and consistent level of Resource Adequacy (RA). (5-6 times more valuable when compared to solar and wind)
- Biomass consistently produces during high demand, high cost hours of the day

## Emissions

- Even the cleanest biomass technologies produce some GHG. Solar and wind generation emit zero carbon.

# Benefits of Biomass Energy

## Renewable

- Meets Renewable Portfolio Standards
- Fuel source is abundant and renewable

## Reliable

Not dependent on sun shining or wind blowing

## Waste and Fire Fuel Reduction

- Diverts biomass that would otherwise go into a landfill
- Reduces transportation-based emissions (primarily diesel trucks) for plants located near fuel collection/processing facility
- Fuel reduction in wildland/urban environments and forests
- Supports SB 1383 (Methane emissions reduction) - organics can no longer be diverted to landfill - Note: Methane gas is a significant contributor to air pollution and climate change, as it traps significantly more heat than carbon dioxide.



# Benefits Continued

## Round the Clock Output

- Produces energy during critical evening hours
- Beneficial to matching hourly load
- Possible downside – it will also produce during daytime hours when solar power is plentiful and prices are low

## Carbon Neutral

Some consider Biomass a carbon neutral resource because its inherent energy comes from the sun and because it can regrow in a relatively short time. Trees take in carbon dioxide from the atmosphere and convert it into biomass and when they die, it is released back into the atmosphere. Whether trees are burned or whether they decompose naturally, they release the same amount of carbon dioxide into the atmosphere. **Columbia University – Earth Institute**

## Beneficial By-Product

Biochar - can be used in a range of applications, from soil amendments to water filtration

# Drawbacks

## **Expensive to Build and Operate/Expensive Energy Cost**

- \$15-16mm - Estimated cost to build new biomass plant at Marin Sanitary Service facility in San Rafael
- \$2-3mm – cost for similar sized solar plant
- Current market price for solar = \$20-25/MWh vs \$70-\$80+/MWh for biomass

## **GHG Emissions & Pollution**

- Emissions depend on technology type
- Potential effect on MCE's Power Content Label
- Depending on the technology, burning wood biomass could emit as much, if not more, air pollution than burning fossil fuels—particulate matter, nitrogen oxides, carbon monoxide, sulfur dioxide, lead, mercury, and other hazardous air pollutants\*

\* Cho, Renee, *Is Biomass Really Renewable?* Earth Institute, Columbia University October, 2016

# Future

## **Possible Mandates**

- Tree Mortality
- Support of SB 1383 – Organic waste no longer allowed in landfill. Must be composted or used as feedstock for biomass to electricity plants.

## **Options to Support Local Projects**

- Existing or expanded Feed-In Tariff
- Bi-lateral contracts
- Both options could include rules to limit to only the cleanest technology

# Thank You

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