Board-adopted Guidelines for Biomass Procurement

1. Issue a Request for Offers targeting power purchase agreements with 1-2 existing facilities.
2. Structure overall biomass procurement strategy around local waste-management and forest restoration priorities and needs.
3. Include environmental, community, and economic considerations in selection process.
4. Contingent on price and market conditions, contract for a target of around 20MW of local biomass energy.
Logging

Thinning, Slash

Fuels-reduction
& Restoration

Timber Lands

Saw Logs - Sent to Mills

Logging
Thinning, Slash

Residual
Waste
Biomass

dimensional
lumber

Paper-quality
Chips (exported)

Animal
Bedding &
Landscaping

Fuel-reduction
& Restoration
Thinning, Slash
Logging, Thinning, Slash & Restoration

Saw Logs - Sent to Mills

Dimensional Lumber

Paper-quality Chips (exported)

Animal Bedding & Landscaping

Residual Waste Biomass

Biomass Plant

Fuels-reduction & Restoration Thinning, Slash

Timber Lands
Logging
Thinning, Slash
Fuels-reduction
& Restoration

Saw Logs - Sent to Mills

Dimensional Lumber

Paper-quality Chips (exported)

Animal Bedding & Landscaping

Residual Waste Biomass

Biomass Plant

Electricity (& Heat)

Fertilizer

Activated Carbon

Timber Lands

Fuel-reduction Thinning, Slash
Total Humboldt County mill residuals = ~400,000 Bone dry tons
Logging, Thinning, Slash, & Restoration

Saw Logs - Sent to Mills
- Dimensional Lumber
- Paper-quality Chips (exported)
- Animal Bedding & Landscaping

Logging, Thinning, Slash

Residual Waste Biomass

~50% of residuals typically sold for other uses, leaving ~200,000+ BDT

Biomass Plant

Fuels-reduction & Restoration Thinning, Slash
Processing 200,000 BDT requires about 25MW of operating power plant capacity
Current or projected wholesale power costs ($/MWh, approximate)
<table>
<thead>
<tr>
<th>Source of Energy</th>
<th>Current or Projected Wholesale Power Cost ($/MWh, Approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Power</td>
<td>$35.00</td>
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<tr>
<td>Large Hydro</td>
<td>$37.50</td>
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<tr>
<td>Wind (Out of State Renewables)</td>
<td>$40.50</td>
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<tr>
<td>Local Community-Scale Solar</td>
<td>$49.50</td>
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<tr>
<td>Local Biomass</td>
<td>$83.00</td>
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<tr>
<td>Local Wind (RePower Estimate)</td>
<td>$82.00</td>
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<tr>
<td>Local Offshore Wind (NREL Estimate)</td>
<td>$89.23</td>
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<tr>
<td>Local Small Hydro (PG&amp;E Price)</td>
<td>$113.00</td>
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</tbody>
</table>

Market prices are low
Market prices = big projects
Current or projected wholesale power costs ($/MWh, approximate)

- System Power
- Large hydro
- Wind (out of state renewables)
- Local community-scale solar
- Local biomass
- Local Wind (RePower Estimate)
- Local Small Hydro (PG&E price)
- Local Off-shore Wind (NREL estimate)

Local/community-scale power comes at a premium
Humboldt Redwood Company PPAs

• $83/MWh bid price, 5-year contract period
• 9 month-term initial PPA at reduce volume for $83, additional generation at market price
• 51-month term at $83 for full volume
  – Includes “Material Change” clause to reduce RCEA risk exposure for multi-year commitment to above-market pricing.
• Environmental & regulatory compliance provisions
Humboldt Redwood Company PPAs

MWh per Month

Market price
Purchases @ $83/MWh
Material Change Policy Elements

Creates opportunity to renegotiate if:

1. RCEA forecasts for the coming year show that we won’t be able
   - Maintain 3% customer rate savings (~$2M/yr)
   - Meet minimum power portfolio requirements and operating costs
   - Reserve accumulation of $2M/yr

2. Customer participation levels are not met
Reserve accumulation

$6M minimum reserve
Reserve accumulation

Example $2M Board allocation in 2020
Future-year Budget Headroom

- Rate savings
- Procurement budget above base cost
- Reserve contribution
- Base/minimum power costs
- Operations
- PG&E PCIA & other fees

<table>
<thead>
<tr>
<th>PG&amp;E</th>
<th>RCEA</th>
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<tr>
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</tbody>
</table>
Future-year Budget Headroom

Costs determined by Board Policy

- Rate savings
- Procurement budget above base cost
- Reserve contribution
- Base/minimum power costs
- Operations
- PG&E PCIA & other fees

Fixed/base costs of providing service
Material Change Clause ensures base operating costs met and also sets minimum values for reserves and rate savings.
Future-year Budget Headroom

Example: PG&E Rate decrease
Future-year Budget Headroom

Material Change allows for maintaining minimum rate savings and reserve contributions by renegotiating price/volume.
Humboldt Redwood Company PPAs

Volume at $83 reduced to maintain 3% rate savings and $2M reserve accumulation
Environmental/regulatory compliance provisions

Questions?
Biomass Procurement Phase 2
Proposed terms for additional biomass procurement

• Additional contract(s) layered on after HRC for available budget
• Base price would be $83/MWh
• PPA terms would be modified version of HRC PPAs Including adjusted version of Material Change clause
Options

1. Pursue negotiations with one additional facility
2. Pursue negotiations with both, with one ranked ahead of the other for allocations of available headroom
3. Pursue negotiations with both, split any headroom equally
Additional PPA(s) layered onto HRC
Additional PPA(s) layered onto HRC

Example: budget moderately constrained

PPA #2 volume at $83 reduced due to budget
Additional PPA(s) layered onto HRC

Example 2: budget significantly constrained

Both PPAs volume at $83 reduced due to budget
Considerations

• Technical analysis/forecasts do not project being able to afford 3 biomass PPAs at $83/MWh

• Preliminary analysis suggests the capacity provided by two operational facilities would be sufficient to process currently-available biomass waste stream.

• The more budget committed to biomass = less available for other priorities (customer programs, new local generation, lowering power mix GHG emissions)
Staff recommendation

• Pursue negotiations with one additional facility
• Select DG Fairhaven for negotiation base on RFO review team’s “offeror viability” scoring.