



BROWN

Renewable Energy Opportunities at Brown

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Discussion Points

- Current Electrical Energy Consumption and Procurement
- Competitive Supply Procurement Contracts with Renewables
- RI Renewable Energy Customer Aggregation experience with Contract for Differences
- Strategic Planning for Utilities
- Forecasting Energy Demand and Prices
- Discussion of issues and opportunities

Brown Renewable Energy Options Under Consideration

- Competitive electrical supply for independently-metered buildings that includes renewable energy
- A contract-for-differences financial hedge that would support a new wind energy plant in the region
- Identify and analyze opportunities to install clean generation technology on Brown property
- Purchase of RECs for select events to raise awareness of renewable energy.

Competitive electric supply opportunities

- Brown's electricity is billed through a main meter that accounts for a majority of its electrical consumption and currently pays the "standard offer" rate through National Grid. Brown will have to purchase electrical supply on the competitive market after January, 2009 when standard offer is no longer available.
 - Standard offer rate is below market. Little incentive to leave before phase out
- Brown also has buildings on independent meters. Brown is investigating competitive electrical supply options for buildings, such as 70 Ship Street and 10 Park Lane, which are not on the main campus meter and currently pay a higher charge for electricity.
- These buildings have a large enough load and consumption to be viable for competitive supply contracts.
- This will allow Brown to gain experience in the market for competitive supply of electricity and probe how we can procure electricity at more competitive rates than the "standard offer" rate.

Contract-for-differences financial hedge

Brown and other institutions and businesses in RI have pursued a CFD as part of a customer aggregation program (RECA) for 2 years

1. The RECA group put out an RFP for a range of renewable options. The CFD appeared to provide the greatest benefits for aggregation to negotiate a contract.
2. The sponsors are presented with an opportunity to take advantage of the long-term price stability of wind energy relative to the volatile prices of fuel-based generation and reduce a portion of its long-term exposure to fuel price hikes.
3. This would not be a perfect hedge against daily fluctuations in our electrical purchases, since we do not, and probably would not have spot-market contracts.
4. It does temper fluctuations in our overall energy purchases because fossil fuel prices are the primary cause of volatility in electricity markets.

Green contract for differences (CFD): Pros

- We can take advantage of the price-certainty and hedge value independent of our consumption levels and load profiles
 - we can contract for a larger portion of our consumption without having to go off of standard offer service
- As a hedge, any downside on this agreement will be offset by an upside on our fossil fuel utility purchases, and vice-versa

Green contract for differences (CFD): Cons

- Timeframe is uncertain for any given project due to permitting and contracting complexity.
- Much more complex contracting arrangement and uncertainty of timeframe and actual output of a renewable plant.
- Brown does not have a full-time utility analyst or manager of energy procurement contracts.
- While this is a hedge against utility volatility, it is more the domain of the investment office as a financial tool.

Key Issues:

- Analyzing long-term hedge value against projected utility costs
 - Campus growth and uncertainty about building loads
 - Long-term price forecasts
 - EIA forecasts still project flat real-costs for energy
- Enabling the construction of a new clean energy source in the region is a high priority for us
 - does not have the immediate public-relations value of national REC purchases

Contracts with Renewables



- Green power using nationally sourced RECs
- Long-term fixed-price green power
- Green contracts for differences (CFD)

<http://www.thegreenpowergroup.org/publications.html>

On-site Opportunities - Aperture



Sciences Library

**Integrated
Curtainwall PV?**

Geo-Chemistry Building

PV on standing seam metal roof



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