



Distributed Generation

Conectiv Power Delivery

Russ Ehrlich

Bob Jubic

Conectiv Energy

Stu Widom

Agenda

- ⌚ **Does Conectiv Power Delivery need Distributed Generation?**
 - Who we are, what we do, when, where and why
 - What makes CPD different ?
- ⌚ **Existing available tariff options.**
- ⌚ **Overview of technical requirements for interconnection.**
- ⌚ **What's constitutes an emergency ?**

Why DG?

Ω **If utilities can supply power to customers why would customers be given the option to run local generation?**

- **Reliability**
- **Power Quality**
- **Economics**

Why DG?

⌚ Transmission/Distribution System Emergency conditions.

- CPD advocates an expedited permitting/regulatory process to locate necessary generation to restore customers. (e.g. substation placed generation)

CPD Available Tariff

- **NEM (Not available to LGS, GS-P & GS-T)**
 - 1. Has a capacity of not more than 25 kilowatts;
 - 2. Uses solar, wind, hydro or other forms of renewable resources as its primary source of fuel;
 - 3. Is located on the Customer's premises;
 - 4. Is interconnected and operated in parallel with the Company's transmission and/or distribution facilities; and
 - 5. Is intended primarily to offset all or part of the Customer's own electricity requirements.

CPD Available Tariff

Ω Rate 'X'

- **QF Status - PURPA**
- This rate schedule is available throughout the territory served by the Company in the State of Delaware and is applicable to purchases of electricity by the Company from cogenerators or small power producers which meet Federal qualifying standards and have a generating capacity of 1,000 kW or less. The rates stated herein are subject to change biennially.
 - Net Excess Option
 - No Sale Option

CPD Available Tariff

Ω EP Rider

- ELECTRICITY PURCHASED BY THE COMPANY FROM COGENERATORS AND SMALL POWER PRODUCERS
 - Cogeneration and small power production facilities which meet Federal qualifying standards may elect to sell energy to the Company. The Company shall purchase such energy under Service Classification "X", Cogeneration and Small Power Production, from qualifying facilities with generating capacity of 1,000 kW or less. Purchases from qualifying facilities with generating capacity of greater than 1,000 kW shall be made under special contracts. The rates paid by the Company under such special contracts shall be related to the Company's avoided costs.
- The terms and conditions of purchase shall vary with the circumstances of each specific installation.

CPD Available Tariff

⌚ Peak Management (PM)

- **Conectiv Power Delivery is not taking new customers into the PM Program in 2004.**
- General Requirements
 - Provide the company a reduction capability of one hundred kilowatts (100 kW) or more and who agrees to either establish a firm service level and curtail load to that level, or agrees to reduce load by a guaranteed amount upon the request of the Company, as set forth herein. The Company reserves the right to limit the total controllable demand served under this Rider on the Company's electric system. Availability is subject to the economic and technical feasibility of the installation of required Company equipment.

CPD Peak Management Stats

2002

- 66 Total Customer in Program
- 14 Total Events
- 87 Hours

2003

- 16 Customers in Program
 - Approx. 17MW
 - (load drop & generation)
- 5 Total Events
- 37 Hours

2004

- 6 Customers in Program
 - Approx. 4MW
 - (load drop & generation)

System Operations Emergency Procedures

- Ω **Voltage Reduction Alert**
- Ω **Voluntary Customer Load Curtailment Alert**
- Ω **Voltage Reduction Warning and Reduction of Non-Critical Plant Load**
- Ω **Manual Load Dump Warning**
- Ω **5% Voltage Reduction**
- Ω **Curtailment of Non-essential Building Load**
- Ω **Voluntary Customer Load Curtailment**
- Ω **Economic Curtailment of EFT and Peak Management**
- Ω **Peak Avoidance Curtailment of Q's**
- Ω **Manual Load Dump**
- Ω **Load Management Curtailments (IA)Steps 1&2**
- Ω **Load Management Curtailments (IA)Steps 3&4**

Final words of Programs...

∞ Energy For Tomorrow

- Cycling of HVAC Equipment
- Cycling of Water Heating Equipment

∞ Standby & Backup Riders

∞ PJM -

- Behind the Meter Generation
- Load Management
- Check the PJM Website for program details

Technical Interconnection Issues

∞ Guidelines for parallel operations.

- IEEE/UL/NEC Requirements
- Application Process

∞ System Protection Review

- Relaying, settings

∞ System Planning

- Power Delivery systems must be designed to handle peak circuit load without generation.

Technical Interconnection Issues (Cont..)

- ∞ **Grid reliability**
- ∞ **Processing applications**
- ∞ **Personnel & Customer safety!**
- ∞ **Rebates &/or Tax Credits**
 - **Delaware Incentives for Renewable Energy are available.**
 - **Contact the Delaware Energy Office for rebate details.**

In Closing....

- Ω **Type of Generation....**(fossil or renewable fuels)
- Ω **Size of Generation....**(residential up to mWs)
- Ω **How is the unit operated.....**(Connected or isolated from the grid/Emergency/Parallel)
- Ω **Customer or utility owned**

Last but not least....What is an Emergency?

⌚ An electric power transmission or distribution system condition requiring manual or automatic actions necessary to prevent electric system collapse, equipment overload, system frequency decay, voltage or var support in efforts to maintain the safety and reliability of electric power systems.

⌚ Main Drivers for Distributed Generation

- Reliability
- Power Quality
- Economics