

Overview of DG Tariff Issues From a National Perspective

Providing 21st Century Service With 19th Century Tools
and Beliefs

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Overview of Presentation

- Some semantic equivocations...
- Why does this matter?
- What is the problem?
- How did we get here?
- Are there solutions?
- What are they?
- Are there any easier solutions?
- How do we get there?
- Summary and next steps.

Equivocations

- Main Entry: **equiv-o-cate**
Date: 1590
1 : to use [equivocal](#) language especially with intent to deceive
2 : to avoid committing oneself in what one says
- “Rates and tariffs”
 - **Tariff:** A document, approved by the responsible regulatory agency, listing the terms and conditions, including a schedule of prices, under which utility services will be provided (NARUC)
 - “For the convenience of the reader, unless the context otherwise indicates, we will use the term "tariff sheet" in the remainder of the narrative discussion when referring to public utility rate schedules.” (FERC)
 - “a schedule of rates or charges of a business or a public utility” (Webster)

Equivocations (cont.)

- “National” Perspective?

to paraphrase Tip O’Neill, perhaps all distribution rates are local...

Contra...likely FERC jurisdiction

- NARUC resolutions http://www.naruc.org/Resolutions/2002/winter/ere/model_interconnection.shtml

WHEREAS, Prior resolutions have recognized that coordination among the States could improve the consistency of treatment so important to the efficient integration of distributed energy resources; and

WHEREAS, Increased national consistency will lower entry barriers and enhance business economic efficiency, yet overly prescriptive national standards would fail to allow for real differences among States, utilities, and customers, and the ready availability of NARUC developed model agreements and procedures will aid in balancing those concerns

- FERC activities (see http://www.ferc.gov/electric/gen_inter.htm)

- Chairman’s mark of current Energy Bill

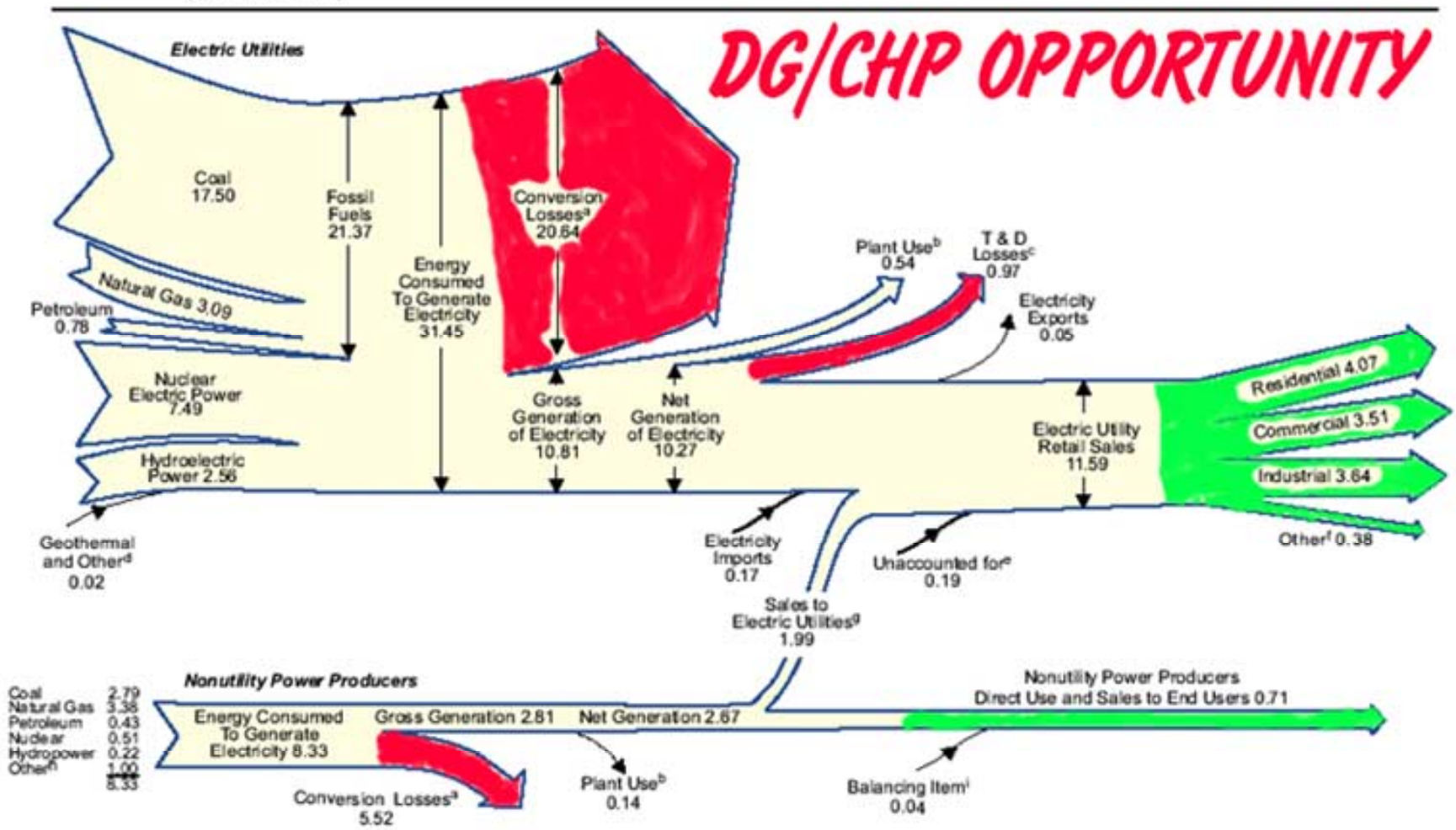
Why do rates and tariffs matter?

- When an energy customer has a problem, and learns DG might be a solution...asks
 - What are my options?
 - What are the important comparison points?
 - Economics is always an issue, though not always the most important
 - What are initial costs?
 - Can I install it?
 - Interconnection studies, requirements
 - Environmental permits
 - Local building, fire
 - How long will it take?
 - What will it cost over the planning horizon...
 - Initial interconnection costs
 - » Fees
 - » Studies
 - » Additional equipment requirements
 - » Delay, re-engineering costs
 - Ongoing relationship with distribution utility
 - Ongoing relationship with ISO or other parties

Answer 2: Ultimately, we must use the 2/3rds of our energy wasted today...

Diagram 5. Electricity Flow, 2000
(Quadrillion Btu)

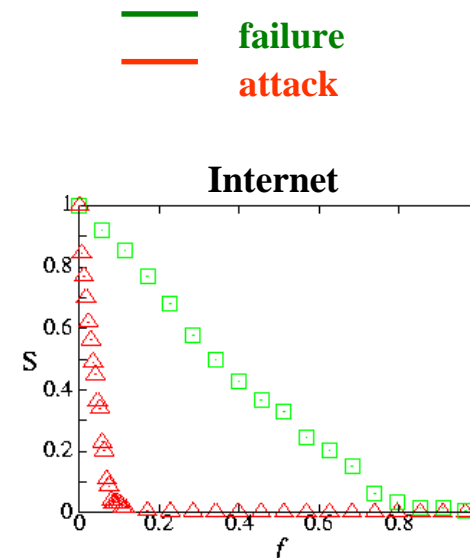
From Energy Information Agency, USDOE, 2000 Annual Energy Review



Answer 3: Likely that current infrastructure has a structural intolerance to attack...

- Structures that have been engineered –or have evolved– to be robust, or tolerant, to error that is “random” tend to utilize hubs with many (redundant) connections. This renders them vulnerable to purposive attack. See Albert and Nakarado, “*The United States Electric Infrastructure – Until Now Based On A Central Station And Optimized For Reliability At Least Cost, Will Require Significant Additions And Distribution Of Generation To Reach Reasonable Security Levels*” (in process)
- See Albert, R., Jeong, H. & Barabasi, A.-L. *The Internet's Achilles' heel: Error and attack tolerance of complex networks. Nature, (2000).*

Achilles' Heel of complex networks



R. Albert, H. Jeong, A.L. Barabasi, Nature **406** 378 (2000)

What are the problems?

- Interconnection costs
- Service costs – legacy of monopoly
 - Standby charges
 - Demand charge methods
 - Exit fees, “stranded cost” recovery
- Anti-competitive discounted rates
- Anti-innovation
- Essence of regulation is cost averaging, sometimes acknowledged cost shifting

How Did We Get Here?

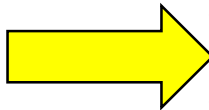
- Historical and organic (co-evolution) legacies that have not been updated to reflect the many changes that have taken place

“The fabric of regulatory wisdom and principles of fairness developed over a time period when the market structure, technological options, and expectations of regulation were very different...”

The World Has Changed

Old Paradigm

- **Information Expensive**
- **Communication Expensive**
- **Monopoly: Customers Assumed**
- **Computation Expensive**
- **Labor Cost Low**
- **Fuel Cost Low**
- **Waste Disposal No Cost**
- **Materials Low Cost**
- **Centralized Model Based on Economies of Scale**



New Paradigm

- **Information Low Cost**
- **Communication Low Cost**
- **Customer Satisfaction Critical**
- **Computation Low Cost**
- **Labor Expensive**
- **Fuel Costs Highly Variable**
- **Waste Disposal Expensive**
- **Materials Expensive**
- **Distributed Models Based on Systems Approach**

Examples? Back to the Problems

- Nature of traditional regulation
 - Set Rates
 - How much total revenue?
 - Allocate the revenue requirement over customer “classes”
 - Today, we talking about determining the answer to the second question-the rate structure
- The process of ratemaking:

“it is beyond the sphere of human ingenuity to reduce the regulatory function of ratemaking to a rule of mathematical certainty.”

Hudson @ M.R.Co v U.S., 33 F.Supp.495, 496 (D.N.J.1940)

- Protection of the Revenue, to protect the rate payer
 - Economic Development
 - Customer Retention
 - Flexible pricing
 - Undisclosed pricing
 - Price Averaging
 - “Desirable” cross-subsidy...

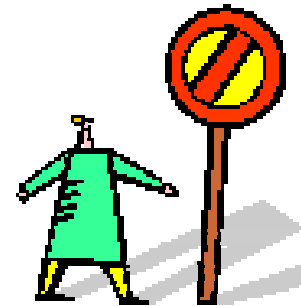
Axioms of Ratemaking

- Allocate Based on Cost of Service
 - Cost causer pays
 - Embedded, marginal, long-term, short term, LRIC...
- What about value?
- Protection of the rate structure
- Rate continuity
- Rate stability and “phase-ins”; rolled in...riders...volume v. percent increases
- Simple
- Uniform (postage stamp) Sort of uniform (license plate)
- Volumetric discounts
- “Firm” Customers “a class of utility customers who are counted on to bear the entire capacity bill, whether or not interruptible customers materialize...Goodman, The Process of Ratemaking V-II at p 1012
- Interclass Relationships General Rule: no unlawful discrimination between customers...
Exception: “between classes “a proper relation of rates based on non-cost factors may provide an appropriate reasonableness standard.” Goodman at 1017

Bonbright's Ten

- Effectiveness in yielding total revenue requirements under the fair return standard
- Revenue stability and predictability
- Stability and predictability of the rates themselves
- Static efficiency of the rate classes and rate blacks in discouraging wasteful use of service
- Reflection of all of the present and future private and social costs and benefits occasioned by the services provision
- Fairness of the specific rates in the apportionment of total costs of service among the different ratepayers so as to avoid arbitrariness and capriciousness and to attain equity in three dimensions: Horizontal (equals treated equally), Vertical (unequal treated unequally; and 3 anonymous (no ratepayer's demands can be diverted away uneconomically from an incumbent by a potential entrant)
- Avoidance of undue discrimination in rate relationships
- Dynamic efficiency in promoting innovation and responding economically to changing demand and supply patterns
- The Related, practical attributes of simplicity, certainty, convenience of payment, economy in collection, understandability public acceptability, and feasibility of application
- Freedom from controversies as to proper interpretation.

Can we develop the solution on these first principles?



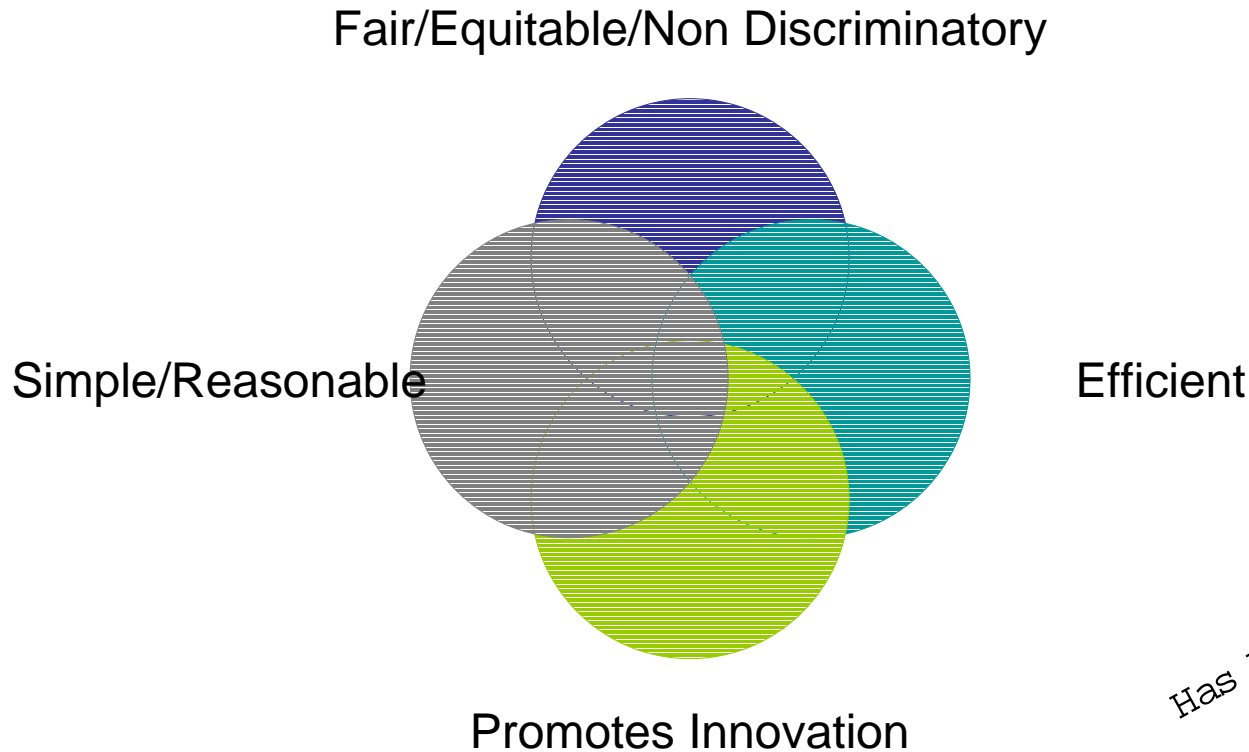
What are the solutions?

- New York's ongoing process...
- Minnesota's recommendations...
- California phase two process
- FERC
- Chairman's mark of Energy Bill
 - Under the guise of net metering
 - Same rates as others in same class
 - No standby, backup, or similar charges

What are the solutions? (cont.)

- Fundamentally, state and federal jurisdictions need to re-determine, given the new and pending facts and circumstances, what is in the public interest...which is a political question...
- Example of easy questions:
 - Hawaii’s “customer retention” rates
 - Virtually everyone’s “economic development rates” see Minnesota’s limits...

Are there any easier solutions?



Has Anyone Seen the Public Interest?

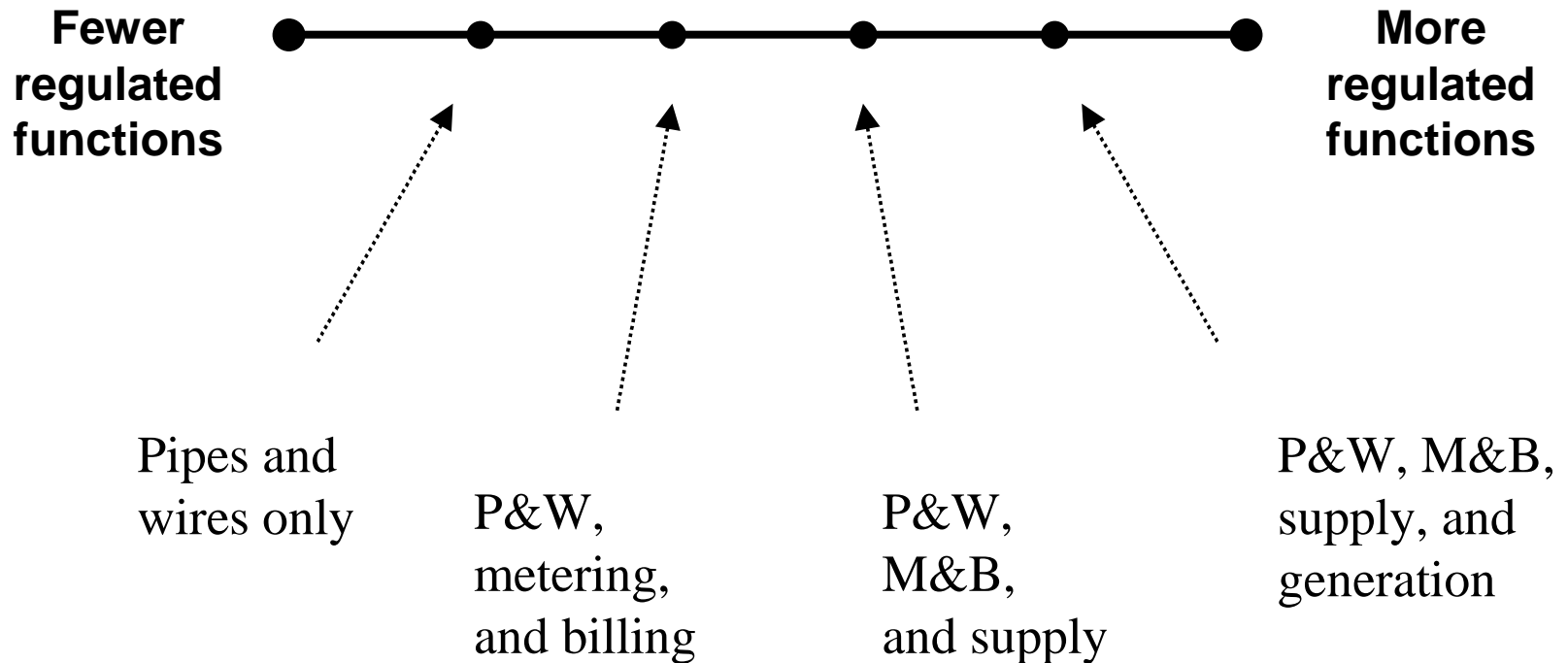


Step 1: Consider a Menu of Service Pricing Options

- Retail customer of any size chooses:
 - What? Power quality; reliability; fuel type; impact on distribution system
 - When? Time of usage
 - Where? Location of usage
 - How much? Amount used; amount exported

From Nat Treadway, CAEM, DOE/NREL Contract on DG Tariffs

Step 2: Examine Industry Structure and Legal Issues



From Nat Treadway, CAEM, DOE/NREL Contract on DG Tariffs

Step 3: Examine the Problems

- Regulated rates take on an aura of correctness with time
- Emphasis is on sunk costs, not efficient future behavior
- Each regulatory jurisdiction makes determinations based on past practices and a historical definition of fairness
- Customers with DER do not have typical load shapes
- Reduced power usage raises suspicion that DER customers are not paying enough (exit fees; stranded cost recovery)
- Incentives for demand-responsiveness may be viewed as subsidies

From Nat Treadway, CAEM, DOE/NREL Contract on DG Tariffs

Step 4: Identify and Resolve Traditional Barriers

- Consider effect of scheduled/unscheduled maintenance on demand charges
- Narrowly define exit fees & stranded costs
- Consider availability and structure of standby and back up tariffs
- Create mechanisms for compensation for DER benefits, competitive procurement by ISOs, interruptible rate options
- Create rights of access to wholesale markets

From Nat Treadway, CAEM, DOE/NREL Contract on DG Tariffs

Step 5: Seek Efficient Distribution Service Pricing

- Distribution service (wires) rates should address:
 - Time – Incremental distribution system costs are incurred largely to meet peak requirements
 - Geography – Location matters to reduce congestion and delay upgrades
 - Firmness of Capacity – Choice of power reliability and quality should matter

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Step 6: Consider a Two-Part Tariff as an Alternative

- Component 1: Sunk fixed distribution system costs
 - Collected from all customers
 - Reflect time of use, firmness, and amount of use
- Component 2: Local incremental costs of the distribution system
 - Incremental benefit or cost due to changes in customer loads

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Step 7:

Take a Flexible Approach

- Traditional versus restructured markets – a fragmented industry structure prevails
 - Develop model DER rates and tariffs – States should choose what they need
- Emotions run high with rate design
 - Prepare a menu of options for regulated services – Customers should choose what they need

From Nat Treadway, CAEM, DOE/NREL Contract on DG Tariffs

How do we get there?

- Federal leadership?
 - FERC
 - Congress
 - DOE
- State Action?
 - Commissions
 - Legislature
 - Courts

Hey, this looks good!

§ 6801. Congressional findings and purpose

- (a) The Congress finds that improvement in electric utility rate design has great potential for reducing the cost of electric utility services to consumers and current and projected shortages of capital, and for encouraging energy conservation and better use of existing electrical generating facilities.

- (b) It is the purpose of this subchapter to require the Secretary to develop proposals for improvement of electric utility rate design and transmit such proposals to Congress; to fund electric utility rate demonstration projects; to intervene or participate, upon request, in the proceedings of utility regulatory commissions; and to provide financial assistance to State offices of consumer services to facilitate presentation of consumer interests before such commissions.

Language from Energy Omnibus Bill of 2003

- `` (1) **NET METERING.--**
- `` (A) Each electric utility shall make available upon request net metering service to any electric consumer that the electric utility serves.
- `` (B) For purposes of implementing this paragraph, any reference contained in this section to the date of enactment of the Public Utility Regulatory Policies Act of 1978 shall be deemed to be a reference to the date of enactment of this paragraph.
- `` (C) Notwithstanding subsections (b) and (c) of section 112, each State regulatory authority shall consider and make a determination concerning whether it is appropriate to implement the standard set out in subparagraph (A) not later than 1 year after the date of enactment of this paragraph."
- (b) **SPECIAL RULES FOR NET METERING.--**Section 115 of the Public Utility Regulatory Policies Act of 1978 (16 U.S.C. 2625) is further amended by adding at the end the following:
- `` (i) **NET METERING.--**In undertaking the consideration and making the determination under section 111 with respect to the standard concerning net metering established by section 111(d)(13), **the term net metering service shall mean a service provided in accordance with the following standards:**
- `` (1) An electric utility--
- `` (A) shall charge the owner or operator of an on-site generating facility rates and charges that are identical to those that would be charged other electric consumers of the electric utility in the same rate class; and
- `` (B) shall not charge the owner or operator of an on-site generating facility any additional standby, capacity, interconnection, or other rate or charge.
- `` (2) An electric utility that sells electric energy to the owner or operator of an on-site generating facility shall measure the quantity of electric energy produced by the on-site facility and the quantity of electric energy consumed by the owner or operator of an on-site generating facility during a billing period in accordance with reasonable metering practices.
- `` (3) If the quantity of electric energy sold by the electric utility to an on-site generating facility exceeds the quantity of electric energy supplied by the on-site generating facility to the electric utility during
- [Page: S5592] [GPO's PDF](#)
- the billing period, the electric utility may bill the owner or operator for the net quantity of electric energy sold, in accordance with reasonable metering practices. `` (4) If the quantity of electric energy supplied by the on-site generating facility to the electric utility exceeds the quantity of electric energy sold by the electric utility to the on-site generating facility during the billing period--
- `` (A) the electric utility may bill the owner or operator of the on-site generating facility for the appropriate charges for the billing period in accordance with paragraph (2); and
- `` (B) the owner or operator of the on-site generating facility shall be credited for the excess kilowatt-hours generated during the billing period, with the kilowatt-hour credit appearing on the bill for the following billing period.
- `` (5) An eligible on-site generating facility and net metering system used by an electric consumer shall meet all applicable safety, performance, reliability, and interconnection standards established by the National Electrical Code, the Institute of Electrical and Electronics Engineers, and Underwriters Laboratories.
- `` (6) The Commission, after consultation with State regulatory authorities and unregulated electric utilities and after notice and opportunity for comment, may adopt, by rule, additional control and testing requirements for on-site generating facilities and net metering systems that the Commission determines are necessary to protect public safety and system reliability.
- `` (7) For purposes of this subsection--
- `` (A) **The term 'eligible on-site generating facility' means a facility on the site of a residential electric consumer with a maximum generating capacity of 10 kilowatts or less that is fueled by solar energy, wind energy, or fuel cells; or a facility on the site of a commercial electric consumer with a maximum generating capacity of 500 kilowatts or less that is fueled solely by a renewable energy resource, landfill gas, or a high efficiency system.**
- `` (B) The term 'renewable energy resource' means solar, wind, biomass, or geothermal energy.
- `` (C) The term 'high efficiency system' means fuel cells or combined heat and power.
- `` (D) The term 'net metering service' means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset electric energy provided by the electric utility to the electric consumer during the applicable billing period."

Summary

- If we want “fair and reasonable” ability of customers to choose distributed generation – MUST Re-Determine “What is in the Public Interest?” This is not as easy as it may sound.
- Can’t stop at adoption of interconnection rules and charges.
- Can’t even stop at the general rates applicable to customer with onsite generation...
- Look at other aspects of the relationship between the customer and the distribution system:
 - Effect on Class determination
 - Elements of rates paid, reasonableness thereof
 - Availability of “wheeling” or “uplift” charges
 - Application to “third parties”, relationship to demand response, ISO needs
- Other, “unintended consequence” type issues
 - Economic development, other forms of discount or incentive rates
 - “Customer retention rates”
 - “Flexible” pricing
- Beware current investment that locks-in obsolete technology along with the monopoly provider—in Colorado, investment in distribution facilities does not require certification.