RATE DESIGN PRINCIPLES AND THEIR APPLICATION TO COMMUNITY SOLAR PROGRAMS

CSVP Workshop

Presented by John Shenot
June 8, 2017

RAP™ Energy solutions for a changing world

solarmarket PATHWAYS

SEMINAL TREATISES ON RATE DESIGN

- Bonbright, J. C. (1961): *Principles of Public Utility Rates*
- Garfield, P., & Lovejoy, W. (1964): *Public Utility Economics*
- Kahn, A. (1970): *The Economics of Regulation*

UPDATED TAKES ON RATE DESIGN

- Bonbright, J. C. (1961): *Principles of Public Utility Rates*
- Garfield, P., & Lovejoy, W. (1964): *Public Utility Economics*
- Kahn, A. (1970): *The Economics of Regulation*
- Lazar, J., & Gonzalez, W. (2015): *Smart Rate Design for a Smart Future*
  - Available at: http://www.raponline.org/document/download/id/7680
- NARUC Staff Subcommittee on Rate Design. (2016): *Distributed Energy Resources Rate Design and Compensation*
  - Available at: https://www.naruc.org/rate-design/

ECONOMIC PRINCIPLES (EXAMPLES FROM BONBRIGHT)

- Tariffs should keep the utility viable
  - Effectively yield the total revenue requirement and result in relatively stable cash flow and revenues from year to year
- Tariffs should fairly apportion the utility's cost of service among consumers
  - Should not unduly discriminate against any customer or group of customers.
- Tariffs should promote economic efficiency in the use of energy as well as competing products and services while ensuring the level of reliability desired by customers.

ECONOMIC PRINCIPLES (EXAMPLES FROM LAZAR & GONZALEZ)

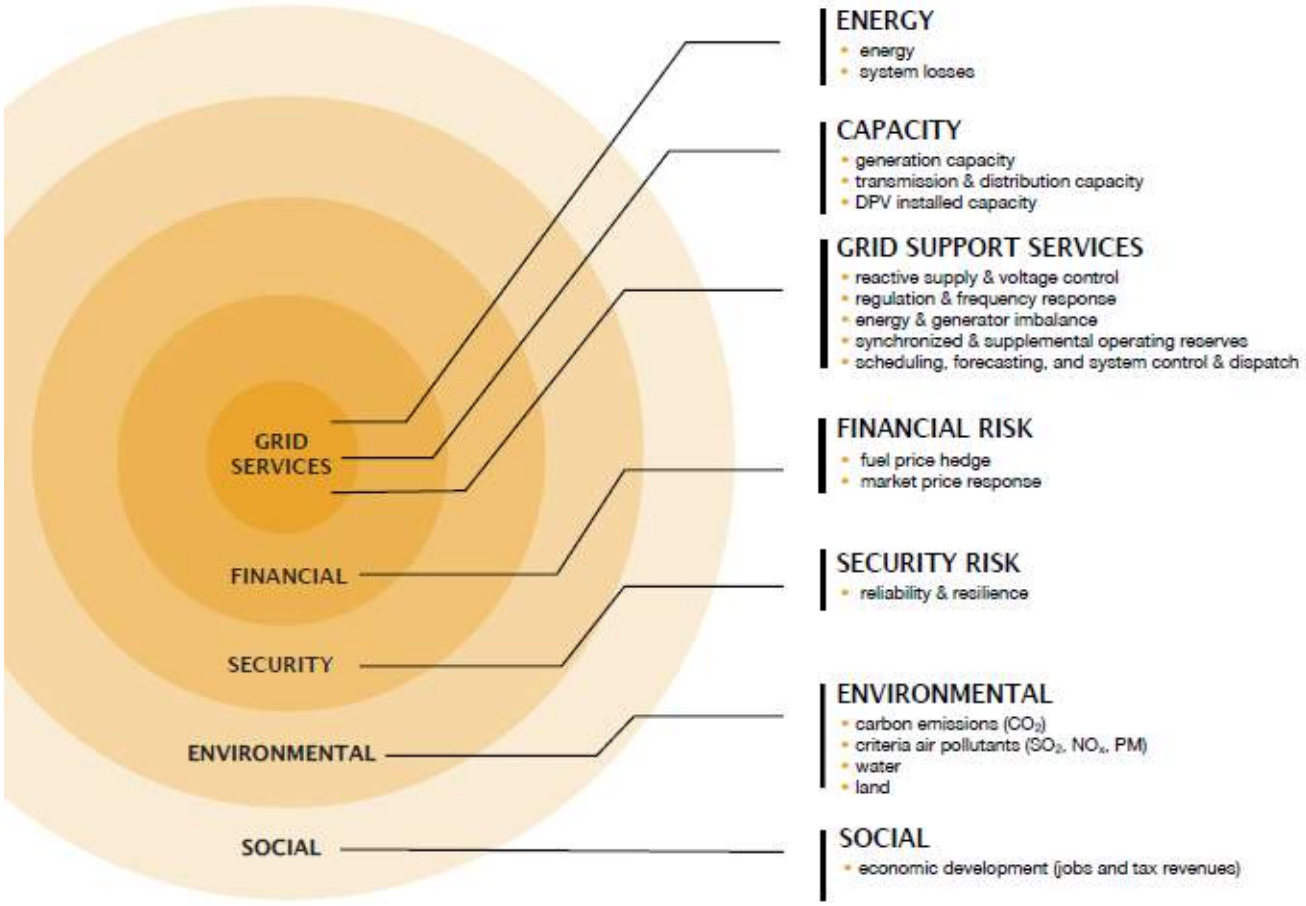
- Customers should be able to connect to the grid for no more than the cost of connecting to the grid
- Customers should pay for grid services and power supply based on how much and when they use grid services and power
- Customers who supply power to the grid should receive full and fair compensation for the power and grid services they supply – no more and no less

EXAMPLE USING GARFIELD & LOVEJOY PRINCIPLES

Garfield and Lovejoy Criteria	CP Demand Charge	NCP Demand Charge	TOU Energy Charge
All customers should contribute to the recovery of capacity costs.	N	Y	Y
The longer the period of time the customer preempts (uses) the capacity, the more the customer should pay for the use of that capacity.	N	N	Y
Any service making exclusive use of capacity should be assigned 100% of the relevant costs.	Y	N	Y
The allocation of capacity costs should change gradually with changes in the pattern of usage.	N	N	Y
Allocation of costs to one class should be affected by how remaining costs are allocated to other classes.	N	N	Y
More demand costs should be allocated to usage on-peak than off-peak.	Y	N	Y
Users of interruptible service should be allocated less capacity costs, but still contribute something.	Y	N	Y

Source: Garfield and Lovejoy (1964), 163–164.

DECIDING WHICH CATEGORIES OF VALUE WILL BE CONSIDERED



Source: Rocky Mountain Institute, *A Review of Solar PV Benefit & Cost Studies*, 2013

EXPANSIVE STUDY: COLORADO

Benefit/(Cost)	Low Gas	Base Gas	High Gas
	$/MWh	$/MWh	$/MWh
Avoided Energy Costs	35.80	52.10	76.10
Fuel Hedge Value	6.60	6.60	6.60
Avoided Emissions	27.40	27.40	27.40
Avoided Generation Capacity	50.60	50.60	50.60
Avoided Distribution	6.00	6.00	6.00
Avoided Transmission	18.00	18.00	18.00
Avoided Line Losses	4.70	6.20	8.30
(Solar Integration Costs)	(0.50)	(1.80)	(4.40)
+10% for Societal Benefits	14.90	16.50	18.90
Total Net Benefits/(Costs)	163.50	181.60	207.50

NON-ECONOMIC PRINCIPLES (EXAMPLES FROM BONBRIGHT)

- Tariffs should be practical
  - Simple, understandable, acceptable to the public, feasible to apply, and free from controversy as to their interpretation
- Rates should be relatively stable
  - Customers experience only minimal unexpected changes that are seriously adverse.

THE SOLAR MARKET PATHWAYS PROJECT IS SUPPORTED BY:

The information, data, or work presented herein was funded in part by the Office of Energy Efficiency and Renewable Energy (EERE), U.S. Department of Energy, under Award Number DE-EE0006907.

AWARDEES OF

Center for Sustainable Energy CALIFORNIA

Virginia Private Colleges

Pace Energy and Climate Center PACE LAW SCHOOL

extensible ENERGY

Dominion

CUNY The City University of New York

SEAL OF COOK COUNTY ILLINOIS

mrea midwest renewable energy association

ecolibrium3 LOCAL ENERGY MATTERS

SALT LAKE CITY

SF Environment Our home. Our city. Our planet. A Department of the City and County of San Francisco

SEPA solar electric power association

INSTITUTE FOR Sustainable Communities

Vermont Energy Investment Corporation

THE SOLAR FOUNDATION Research and Education to Advance Solar Energy