

# Sustainable Tariffs Setting for Island Systems

Organized by Asian Development Bank (ADB) and  
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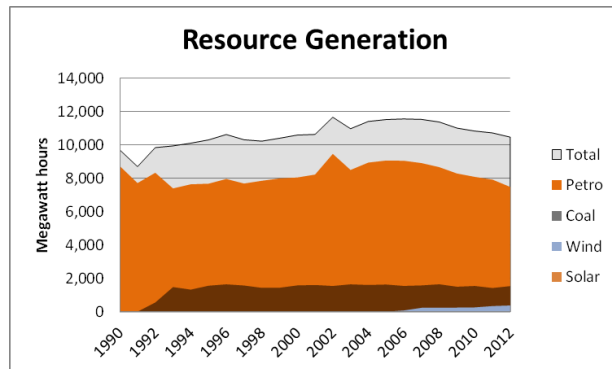
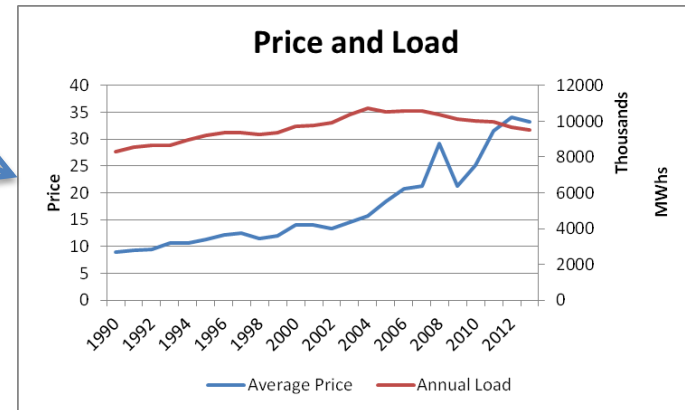
Presented by J. Riley Allen  
RAP, Global Research Manager

# Topics

1. Common features of island systems
2. Cost-effective clean energy solutions
3. Avenues for acquiring clean energy
4. Tariff regulatory frameworks and decoupling margins from sales
5. Pricing principles and options

# Common characteristics of island systems

High rates and moderating to declining loads

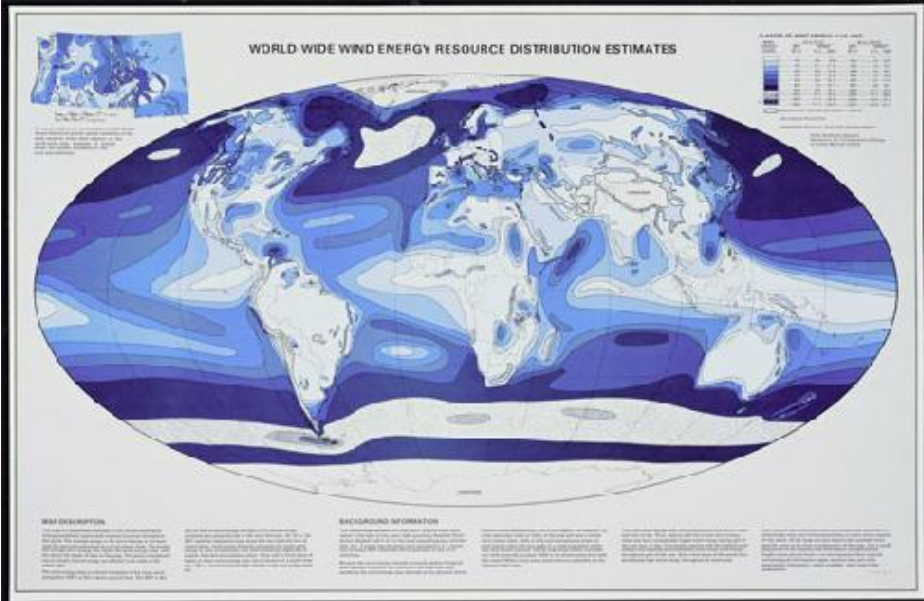
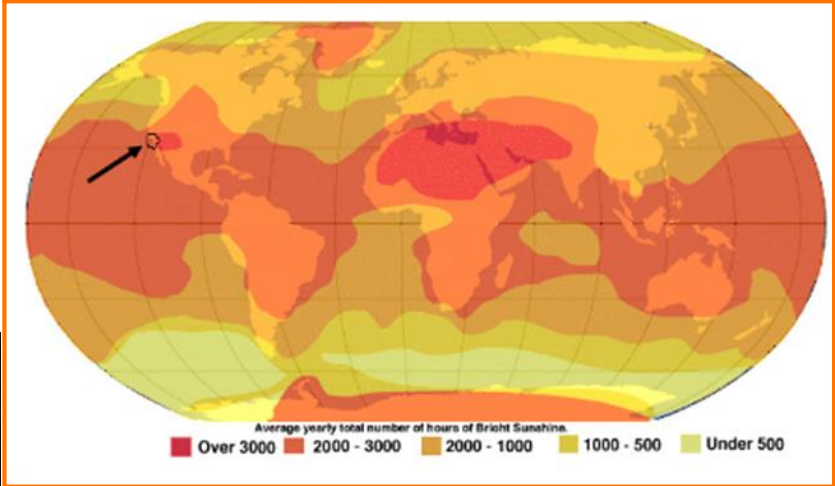


High proportion of fossil fuel generation (esp. diesel)

Source: RAP/EIA, [www.eia.gov](http://www.eia.gov)

# Cost-Effective Clean Resources Available to Islands Include Solar and Wind

Significant opportunity for renewables and distributed generation

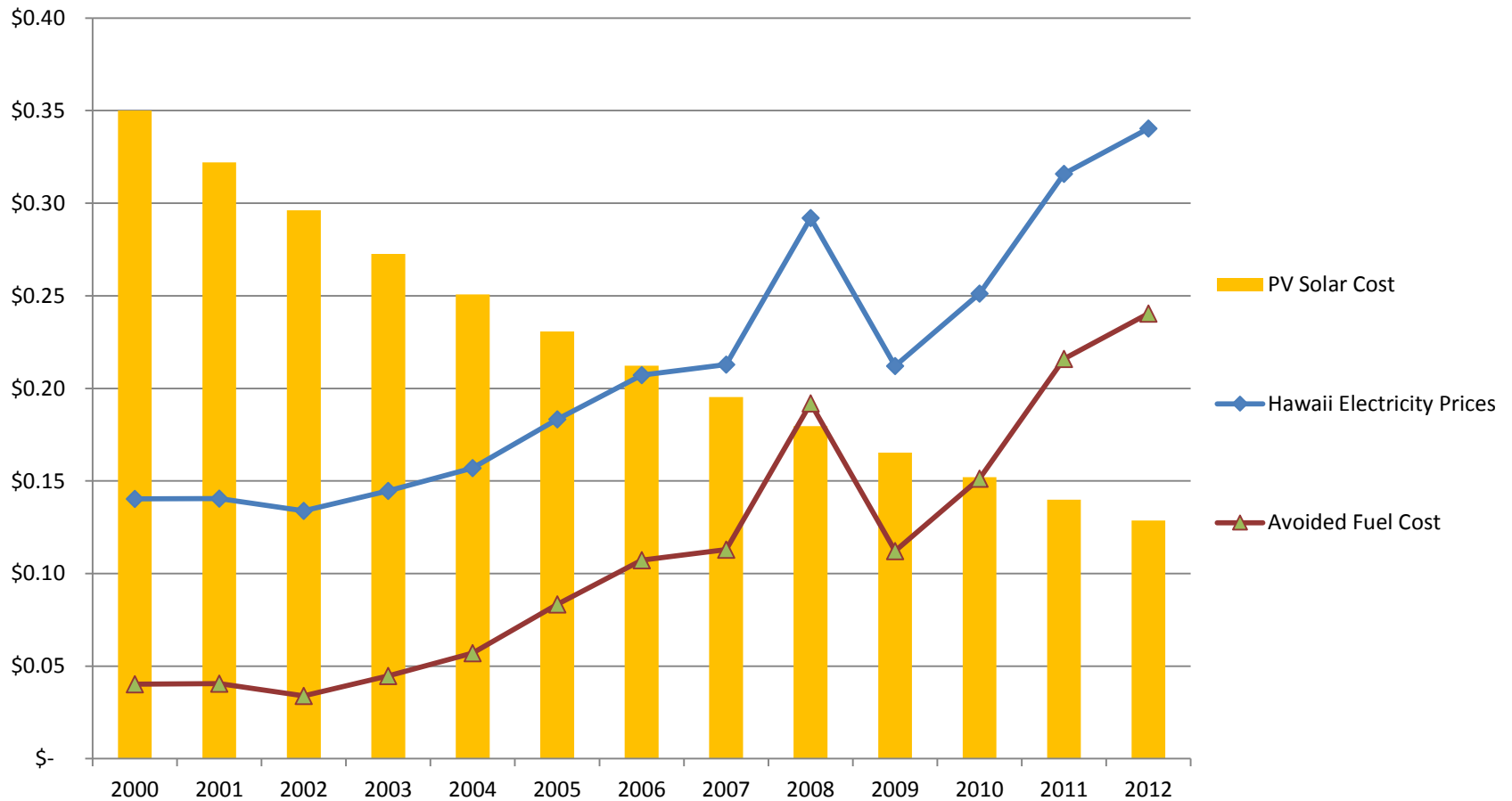


# Almost Everything is Cheaper than Diesel

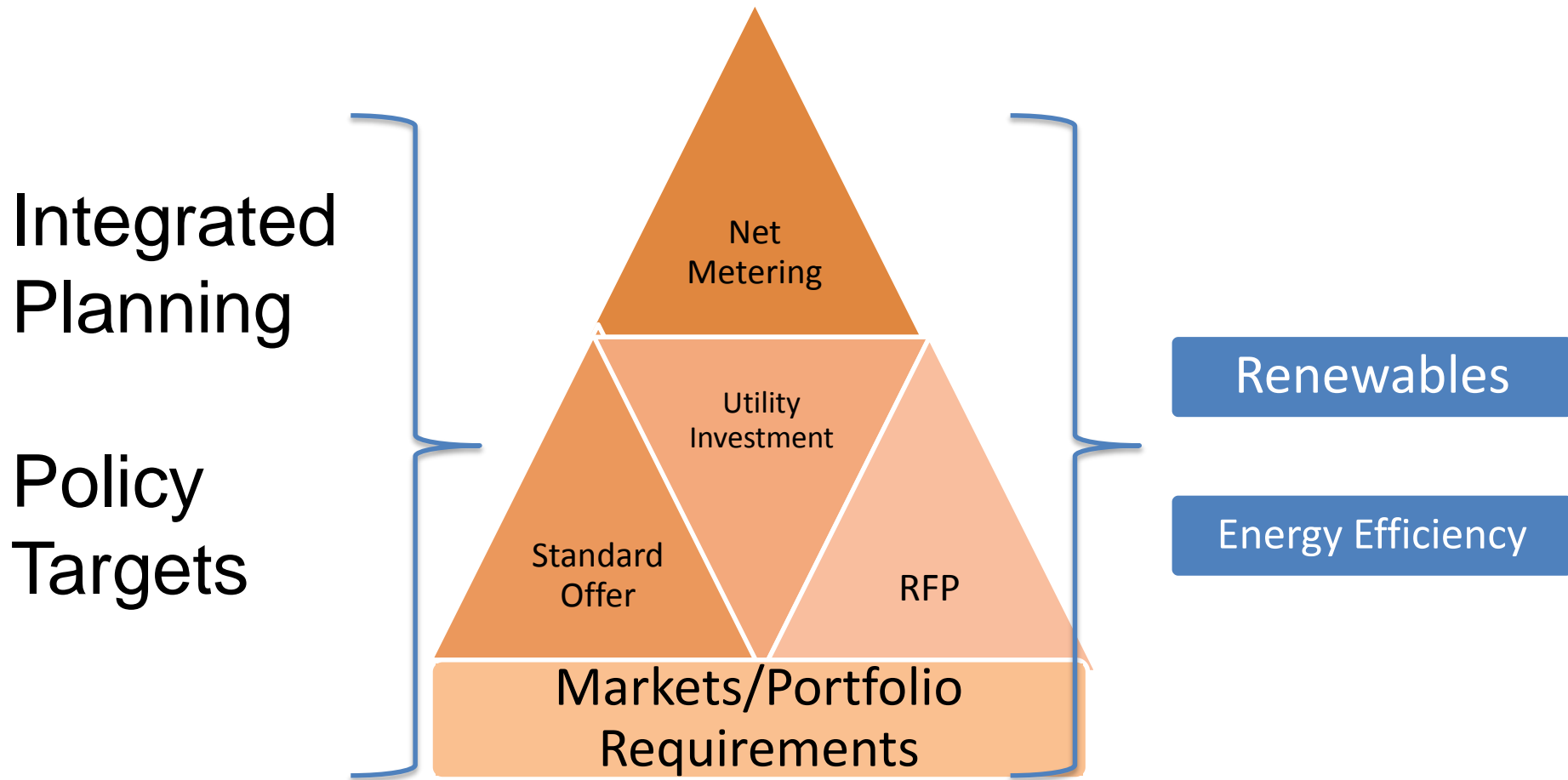
<b>Oil Generated Electricity @ \$110/bbl oil</b>	<b>\$0.32/kWh</b>
<b>Solar PV</b>	<b>&lt;\$0.15/kWh</b>
<b>Wind Generation</b>	<b>&lt;\$0.12 kWh</b>
<b>Solar Water Heater</b>	<b>\$0.08 kWh</b>
<b>Energy Efficiency</b>	<b>&lt;\$0.08 kWh</b>

Source: RAP, BNEF,  
Lazard

# PV Costs versus Retail Prices and Avoided Costs



# Utility and Policy Avenues for Promoting Clean Resource Initiatives and Commitments



# Alternative Regulatory Frameworks for Setting Tariffs

1. Cost of Service (“Traditional Regulation”) sets prices
2. Performance-Based Regulation  
Multi-year framework
  - Price Cap Regulation (Inflation minus X or CPI-X)
  - Revenue Cap Regulation (Inflation minus X) with Performance metrics



# Traditional Regulation

1. In most jurisdictions, regulators only set *prices* for utility services
2. Consequently, the *actual revenue* that a company collects depends on sales:
  - Revenue = Price \* Units Sold
  - Utility makes money in two ways: cutting costs and increasing sales

Marginal cost is almost always less than marginal revenue  
This is called the “throughput incentive”
3. This means that changes in sales can have a powerful effect on profits

# Impacts of sales growth or decline on earnings (investor-owned utility)

% Change in Sales	Revenue Change		Impact on Earnings		
	Pre-tax	After-tax	Net Earnings	% Change	Actual ROE
5.00%	\$9,047,538	\$5,880,900	\$15,780,900	<b>59.40%</b>	17.53%
4.00%	\$7,238,031	\$4,704,720	\$14,604,720	<b>47.52%</b>	16.23%
3.00%	\$5,428,523	\$3,528,540	\$13,428,540	<b>35.64%</b>	14.92%
2.00%	\$3,619,015	\$2,352,360	\$12,252,360	<b>23.76%</b>	13.61%
1.00%	\$1,809,508	\$1,176,180	\$11,076,180	<b>11.88%</b>	12.31%
0.00%	\$0	\$0	\$9,900,000	<b>0.00%</b>	11.00%
-1.00%	-\$1,809,508	-\$1,176,180	\$8,723,820	<b>-11.88%</b>	9.69%
-2.00%	-\$3,619,015	-\$2,352,360	\$7,547,640	<b>-23.76%</b>	8.39%
-3.00%	-\$5,428,523	-\$3,528,540	\$6,371,460	<b>-35.64%</b>	7.08%
-4.00%	-\$7,238,031	-\$4,704,720	\$5,195,280	<b>-47.52%</b>	5.77%
-5.00%	-\$9,047,538	-\$5,880,900	\$4,019,100	<b>-59.40%</b>	4.47%

# Least-Cost Service Should be the Most Profitable

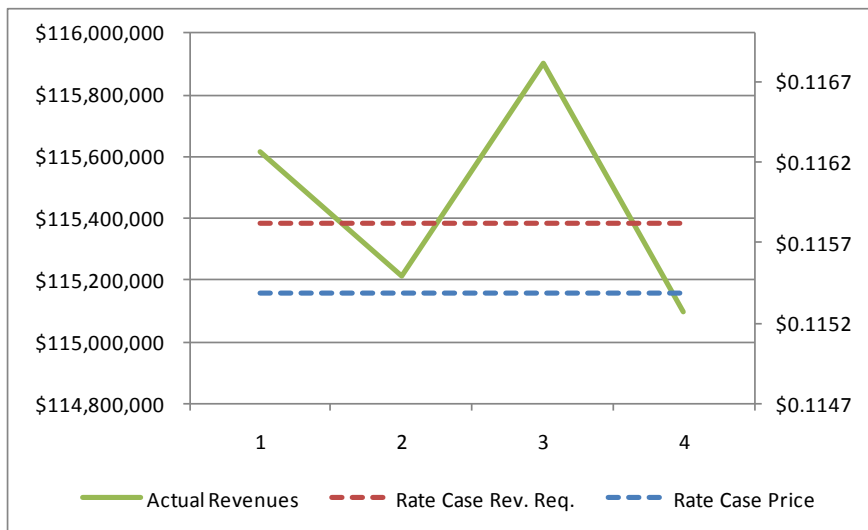
1. The “throughput” incentive is at odds with public policy to supply electric power services at the lowest total cost:
  - inhibits a company from supporting investment in and use of least-cost energy resources, when they are most efficient,
  - encourages the company to promote incremental sales, even when they are wasteful
2. Ratemaking policy should align utilities’ profit motives with public policy goals: acquiring all cost-effective resources, whether supply or demand
3. The utilities’ throughput incentive promotes inefficient outcomes, even where:
  - there is no programmatic energy efficiency; and
  - even with third-party administration of energy efficiency programs.

# Revenue Cap

- Revenue cap regulation targets revenue levels and decouples sales from margin or profits.
- Profits increase by managing costs.
- Risks Reduced for Customers and Utility
  - Weather
  - Economy

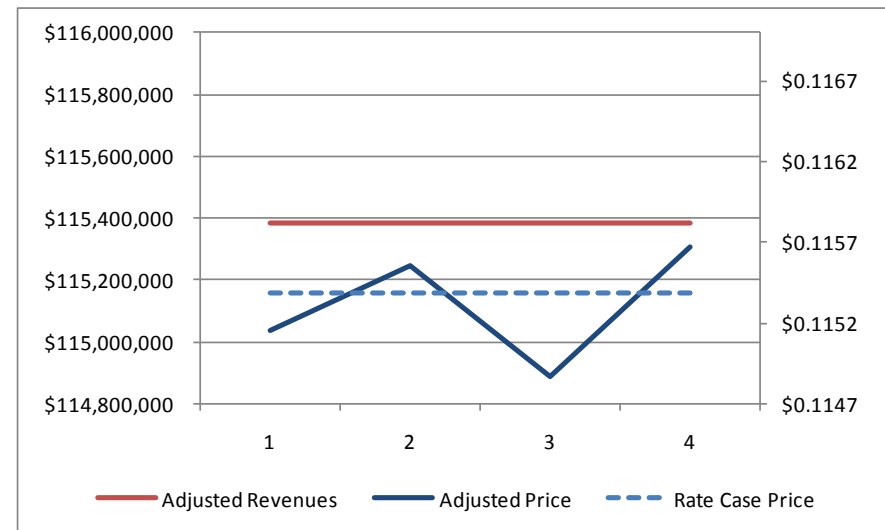
# The Essential Characteristic of Decoupling

- Traditional Regulation:  
Constant Price =
- Fluctuating Revenues



$$\text{Revenues} = \text{Price} * \text{Sales}$$

- Decoupling:  
Precise Revenue Recovery =
- Fluctuating Prices



$$\text{Price} = \text{Target Revenues} \div \text{Sales}$$

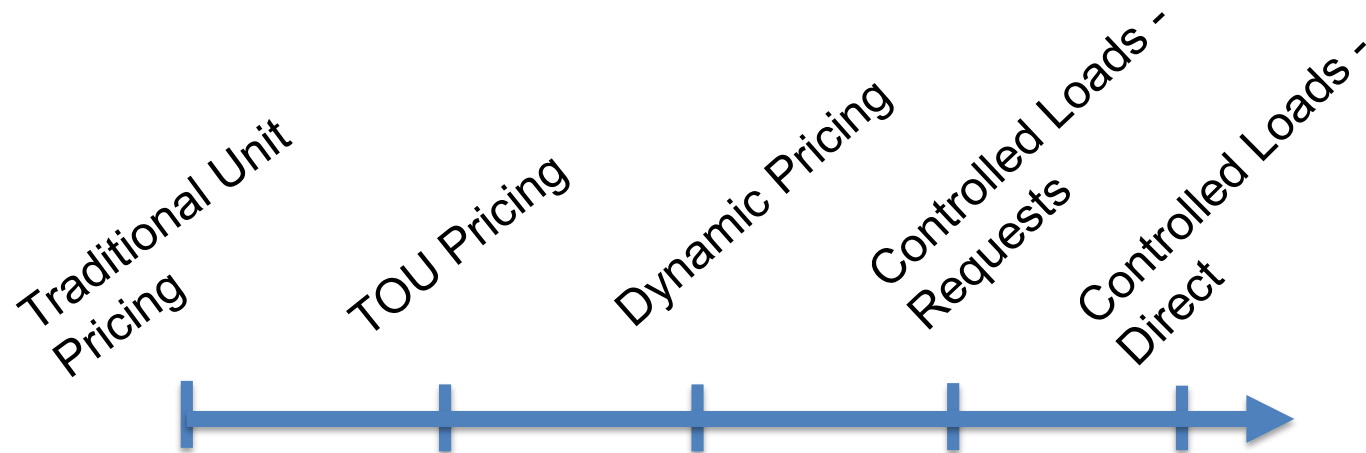
# Performance-based regulation in concert with “decoupling” or revenue cap regulation can...”

1. Remove disincentives to encouraging in energy efficiency and distributed generation;
2. Create incentives (through PBR) to do the same;
3. Encourage the development of helpful rate designs to encourage clean energy and demand-side flexibility.

# Several pricing regulations can be used to support increased utility investments in EE and RE



# Several pricing regulations can be used to shift loads for system benefit





# Recommendations

1. Foster sound planning (e.g., IRP) and policy targets, creative solutions to cost-effective clean energy (renewables and EE).
2. Create regulatory framework that aligns utility performance with least-cost solutions (PBR Revenue-Cap Regulation);
3. Look integration strategies/optional retail services to foster flexible loads to complement variable energy resources

# Suggested Reading and Reference Materials

- Allen, R., Migden-Ostrander, J., The Role of a Power Sector Regulator to Strengthen Sector Performance in Puerto Rico, RAP, Feb 2014, <http://www.raonline.org/document/download/id/7043>
- Lazar, Jim; Teaching the Duck to Fly, RAP, Feb 2014, available at <http://www.raonline.org/document/download/id/6977>
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- Lazar, J., Weston, R., Shirley, W., Revenue Regulation and Decoupling: A Guide to Theory and Application, Jun, 2011, <http://www.raonline.org/document/download/id/902>
- Salvatore, J., H1 2014 Levelized Cost of Electricity Update, BNEF, January 2014, [www.bnef.com](http://www.bnef.com)
- Lazard Associates, Lazard's Levelized Costs of Energy Analysis, Version 7.0, August 2013, [http://gallery.mailchimp.com/ce17780900c3d223633ecfa59/files/Lazard\\_Levelized\\_Cost\\_of\\_Energy\\_v7.0.1.pdf](http://gallery.mailchimp.com/ce17780900c3d223633ecfa59/files/Lazard_Levelized_Cost_of_Energy_v7.0.1.pdf)

## About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at [www.raonline.org](http://www.raonline.org)

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### **The Regulatory Assistance Project**

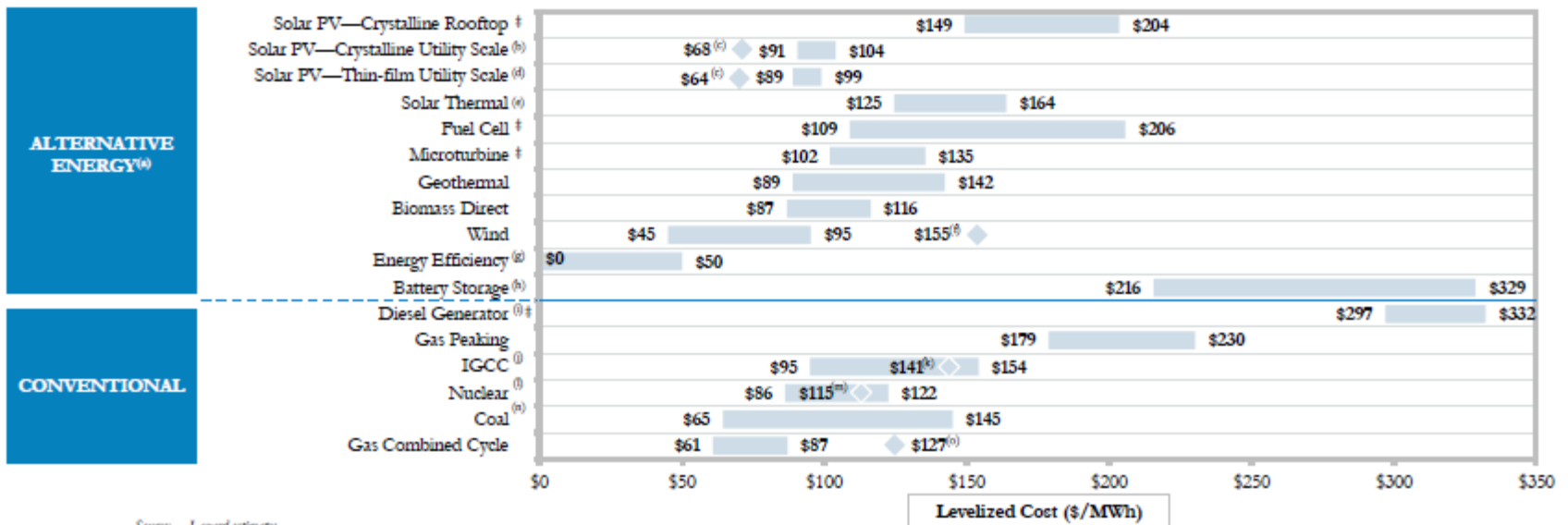
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# Extra Slides

## Unsubsidized Levelized Cost of Energy Comparison

Certain Alternative Energy generation technologies are cost-competitive with conventional generation technologies under some scenarios, before factoring in environmental and other externalities (e.g., RECs, transmission and back-up generation/system reliability costs) as well as construction and fuel cost dynamics affecting conventional generation technologies



Lazard Associates, Lazard's  
Levelized Costs of Energy  
Analysis, Version 7.0