

FTC Solar Workshop

Facts on the Ground: Operational, Planning and Portfolio Considerations

Allen Mosher


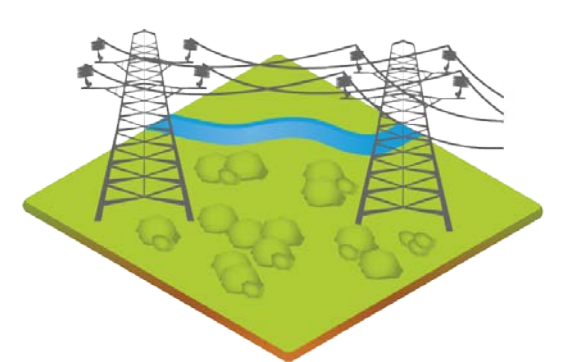
Vice President, Policy Analysis
American Public Power Association

June 21, 2016

Public Power Utility Profile

- Business model: community/state owned, not-for-profit
- Assets: distribution; some own generation and transmission as well
- Size: small towns to large urban centers; median 2,000 customers
- Services: obligation to serve; bundled retail service
- Rates: cost-based
- Regulation: city council or governing board

The Bulk Power System in North America

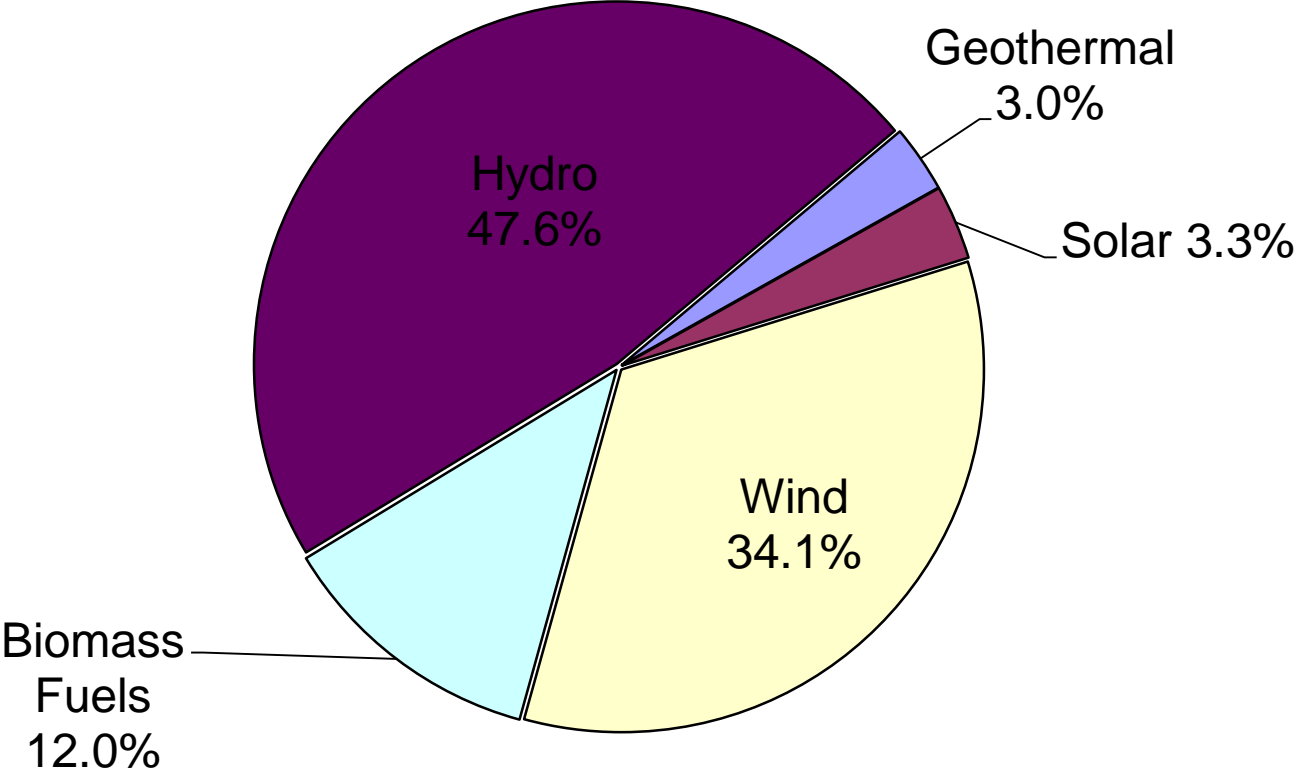
	
<p>Generation</p>	<p>Transmission</p>
<p>Over 5,000 plants</p>	<p>Over 483,000 circuit miles</p>
<p>Over 1,000,000 MW Total Peak Capacity</p>	<p>320 Transmission Operators</p>
<p>Peak Natural Gas Capacity – 42%</p>	<p>Over 2,000 Substations</p>
<p>Peak Coal Capacity – 27%</p>	<p>115kV – 735kV (AC), Some DC</p>
<p>Peak Renewables – 3%</p>	



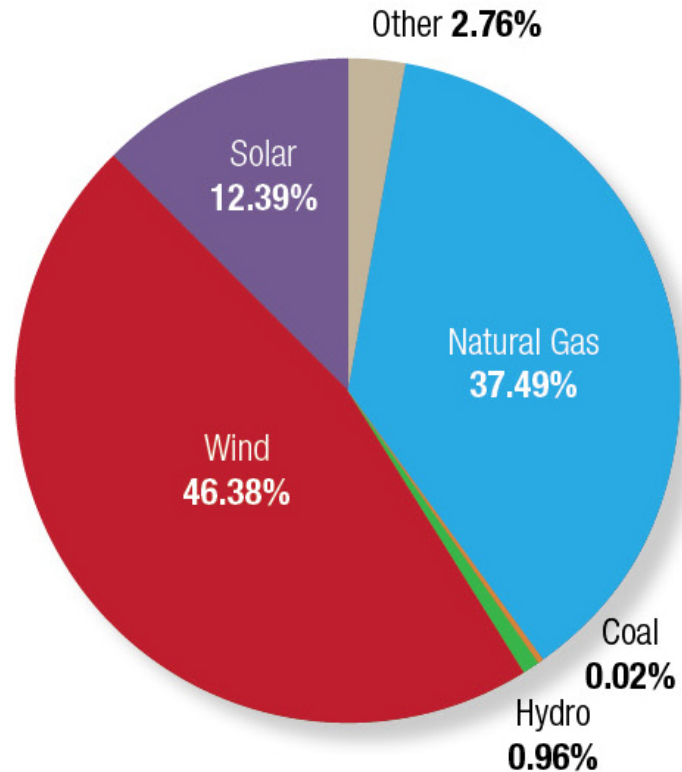
Distribution

<p>Over 2,200,000 miles</p>
<p>430 Distribution Providers (NERC Registered)</p>
<p>Over 980,000 MW Peak Demand</p>
<p><1% Peak Demand Annual Growth</p>
<p>~10 GW Solar PV</p>

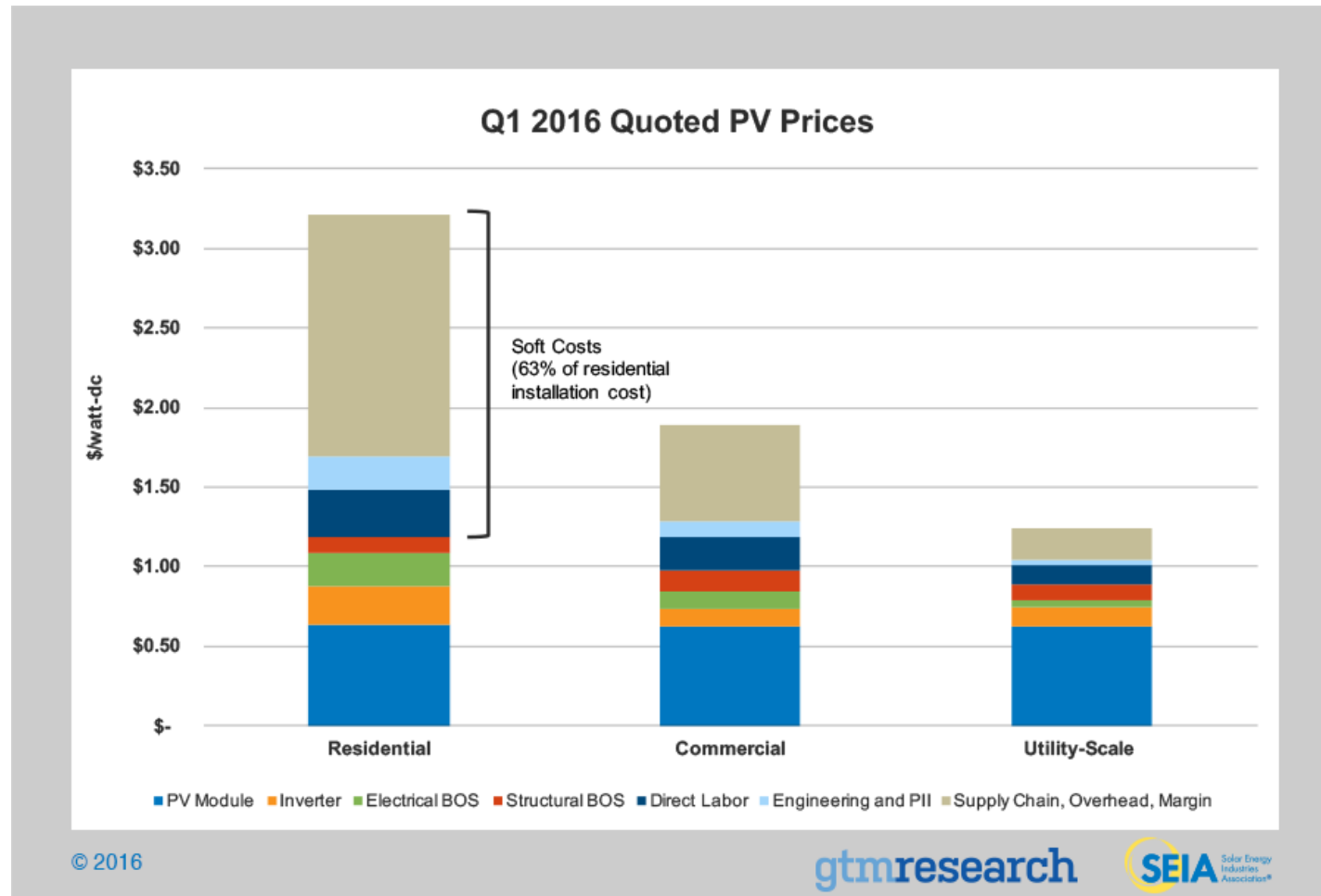
U.S. Utility Renewable Generation by Fuel Type



U.S. Utility Capacity Additions by Fuel Type, 2015



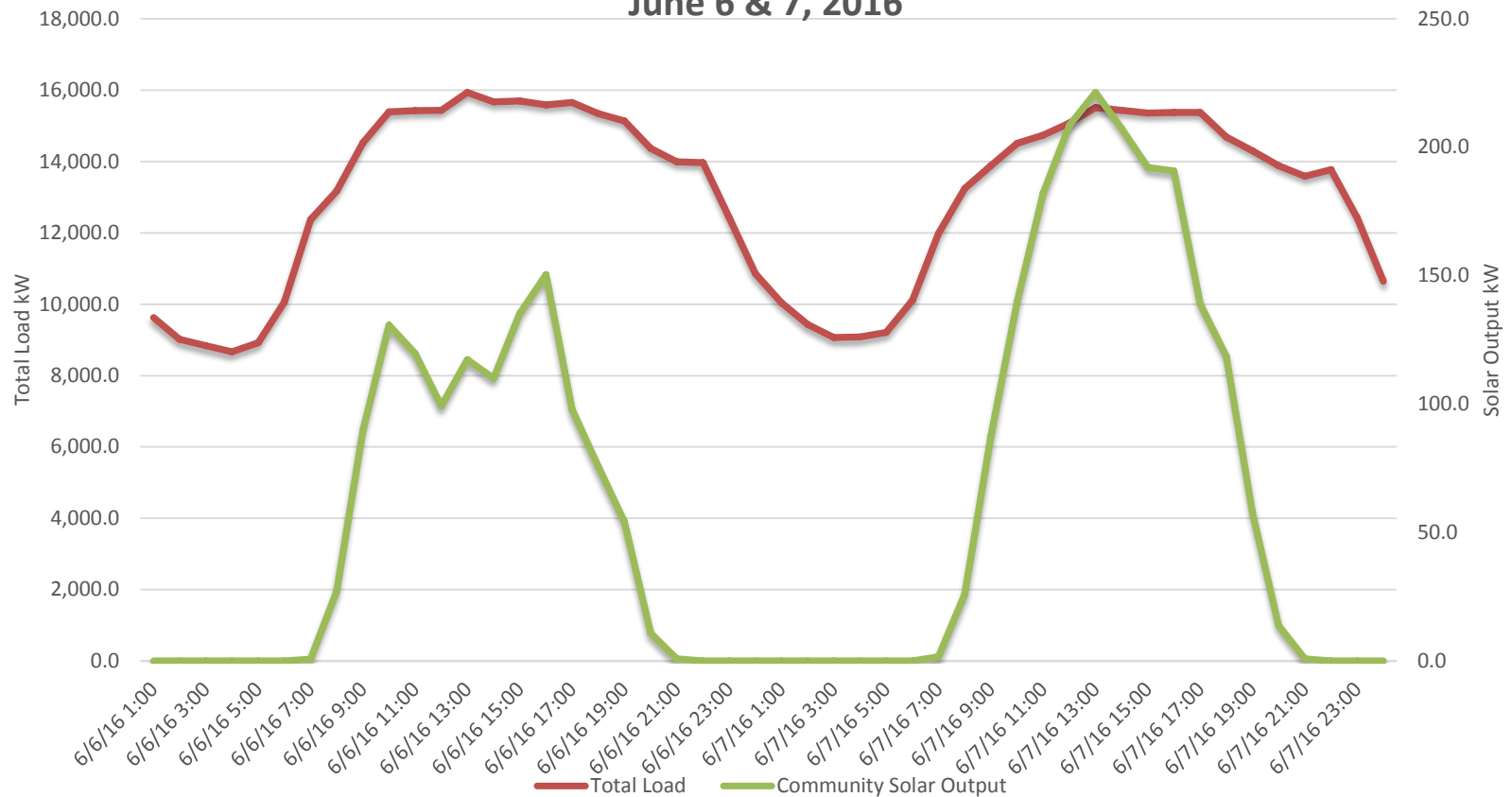
Scale Matters: Solar PV Prices



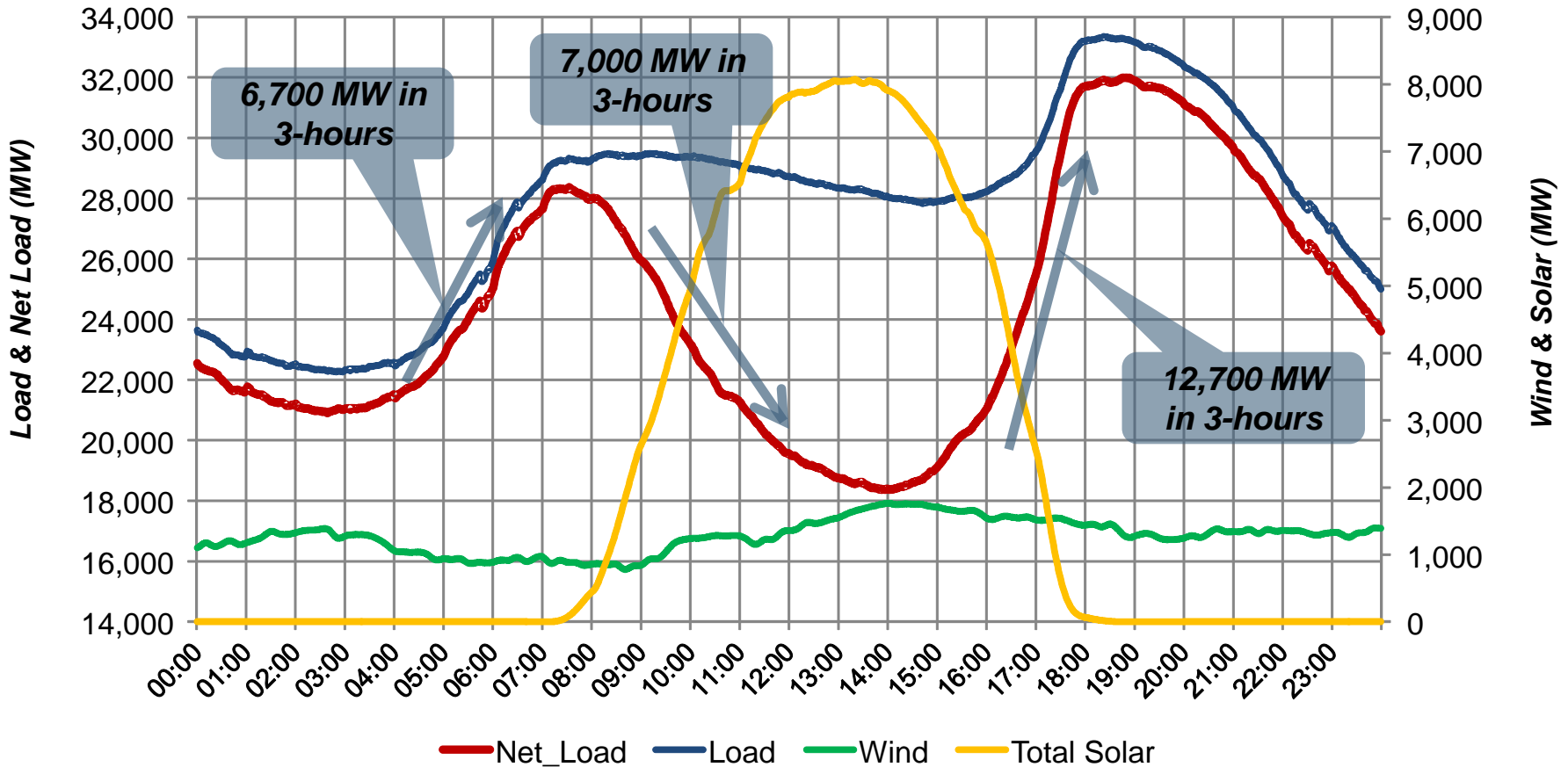
Source: Solar Energy Industries Association

Solar PV Variability Matters

River Falls Electric Utility
Comparison of Total Load to Community Solar Output
June 6 & 7, 2016

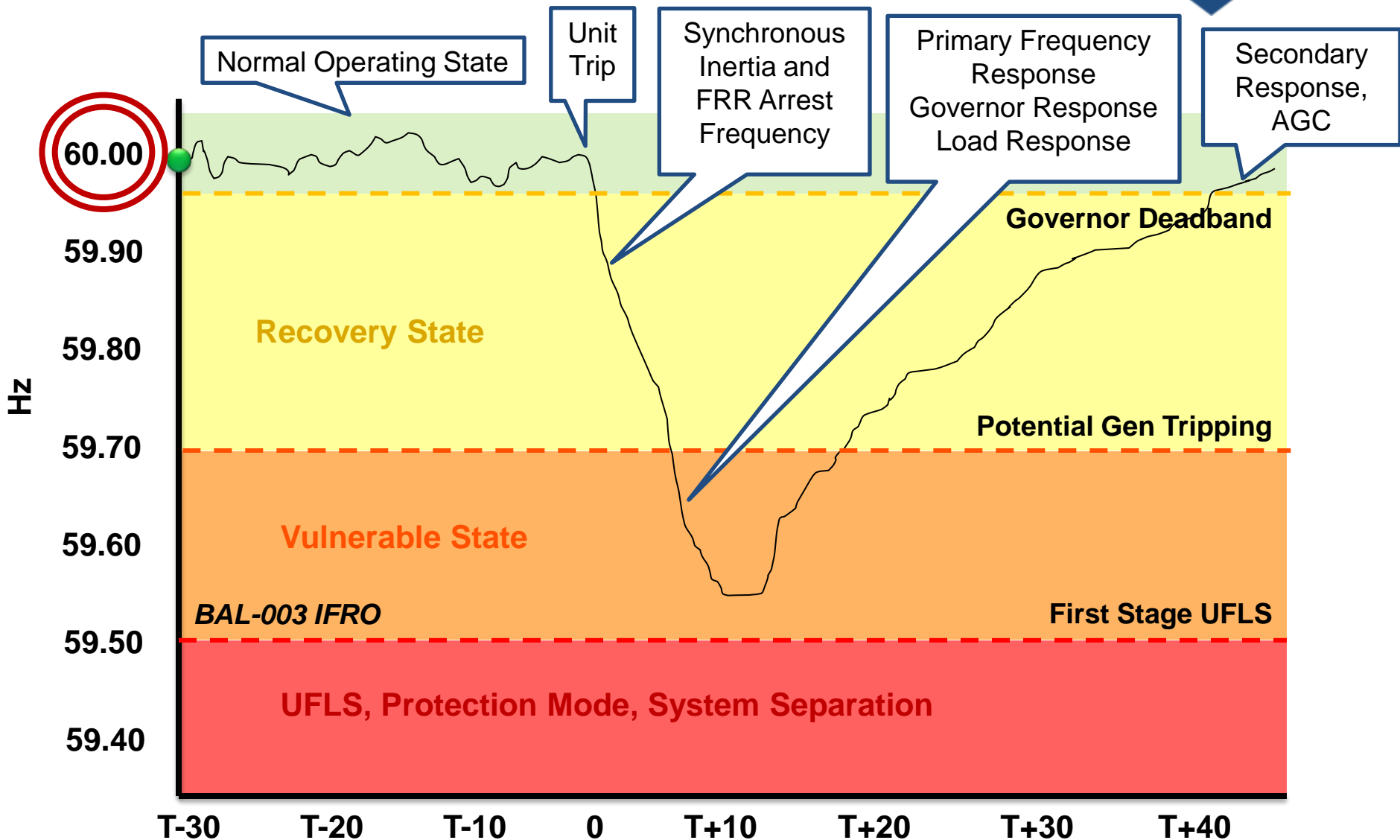


**CAISO Load, Wind & Solar Profiles --- Base Scenario
January 2020**



$Net\ Load = Load - Wind - Solar$

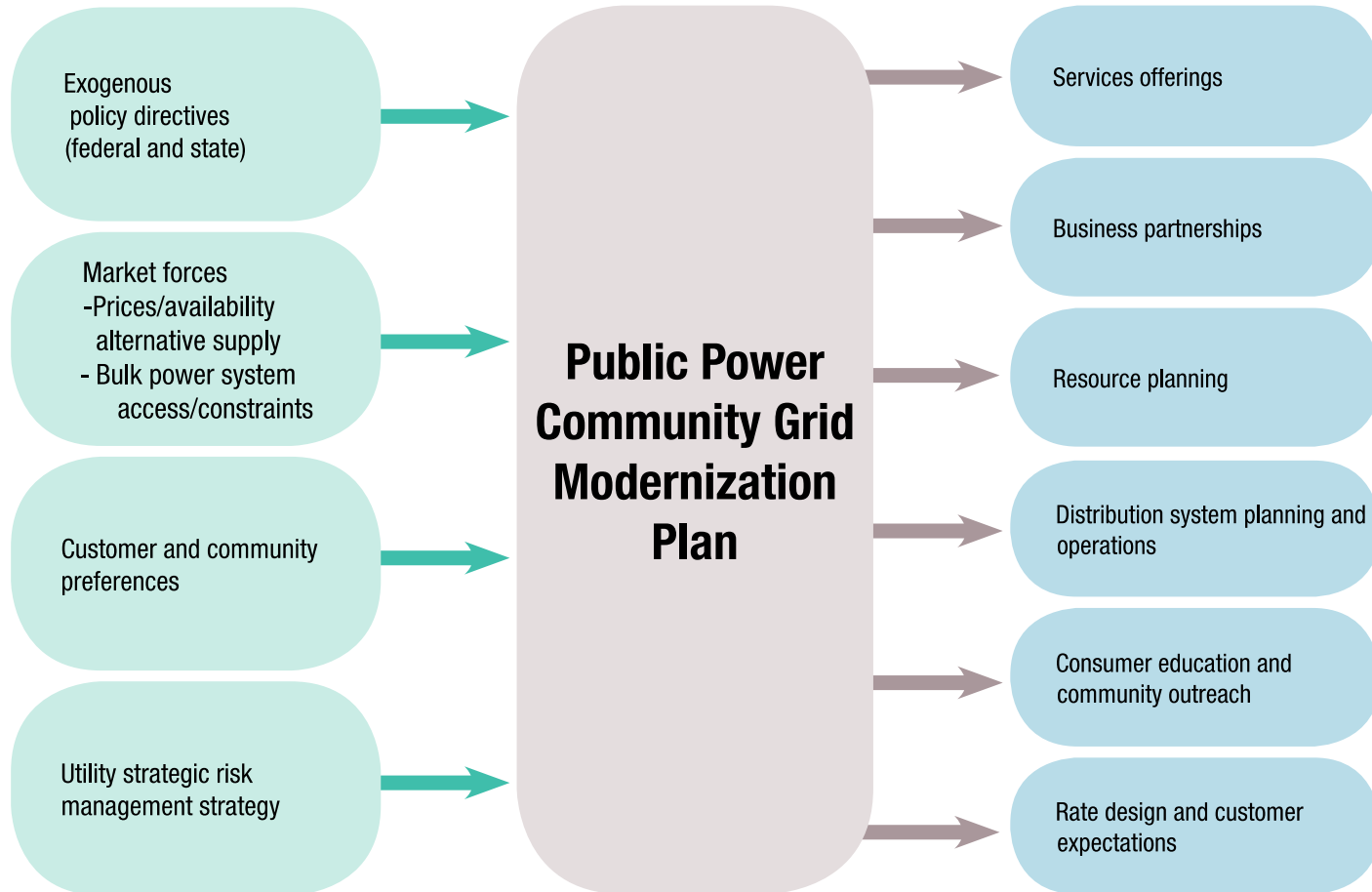
Anatomy of a Frequency Excursion with Recovery



Factors Driving Industry Change

- Renewables poised for significant growth
- Energy storage and other technologies not yet commercially viable (but coming!)
- Emerging suite of conventional and advanced customer-side technologies
 - smart thermostats and grid-connected appliances *that can*
 - save customers money *and*
 - make more efficient use of the grid

The Public Power Forward Strategy



Rate Design Principles:

Rates should be:

- Fair and non-discriminatory across classes
- Simple enough for customers to understand
- Encourage economic efficiency
- Avoid cross-subsidies
- Achieve rate and revenue stability and adequacy
- Allocate risk efficiently

Each utility needs to make its own choices based on community preferences and goals

Marketing Versus Consumer Protection

Allen,
Now It Pays to Go Solar
Just Like Your Neighbors On
Coach St

SolarEnergyWorld
Because Tomorrow Matters

www.BecauseTomorrowMatters.com

3 Tips for Converting to Solar

3 Sugerencias para Convertir a Solar

- 1. Know Your Energy Usage**
Conozca el Uso de Energía
Visit coltononline.com and download the last 12 months of your utility bills
Visite coltononline.com y descargue los últimos 12 meses de sus facturas de servicios
- 2. Get Multiple Quotes**
Obtenga cotizaciones múltiples
Obtain quotes from different Solar vendors
Obtenga cotizaciones de diferentes proveedores solares
- 3. Call Colton Electric Utility**
Llame a Colton Electric Utility
Schedule a meeting with your Colton Electric Solar Advisor
Haga una cita con su asesor Solar Electric Colton

(909) 514-4214 www.coltononline.com



For more information:

- *See the APPA Public Power Forward page:*
<http://www.publicpower.org/Topics/Landing.cfm?ItemNumber=45624>
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