Committees on Consumers and the Public Interest, Electricity, Energy Resources and the Environment, and Gas

A New Approach to Energy Affordability

Tuesday, February 11, 2020
Hon. Neil Chatterjee
Chairman
Federal Energy Regulatory Commission

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NARUC Winter Policy Summit
February 11, 2020
Judith Schwartz, To the Point
California’s Fuel Supply Mix 2020

Imports: Natural Gas and Coal

Natural Gas

Large Hydro

Nuclear

Biogas and fuel cells

Biomass

Small hydro

Wind and Solar

Geothermal

Generator

Microgrid/solar/fuel cells

Rooftop solar

Solar Canopies

Community Solar/microgrid
100% Carbon Neutral ($$$ RECs & Offsets)

Imports: Natural Gas and Coal

Natural Gas

Large Hydro

Nuclear

Biogas and fuel cells

Biomass

Small hydro

Wind and Solar

Geothermal

Generator

Microgrid/solar/fuel cells

Rooftop solar

Solar Canopies

Community Solar/microgrid
100% Renewables (California RPS)

- Imports: Natural Gas and Coal
- Natural Gas
- Large Hydro
- Nuclear
- Biogas and fuel cells
- Biomass
- Small hydro
- Wind and Solar
- Geothermal
- Generator
- Microgrid/solar/fuel cells
- Rooftop solar
- Solar Canopies
- Community Solar/microgrid
100% Zero Carbon

Imports: Natural Gas and Coal

Natural Gas

Large Hydro

Nuclear

Biogas

Hydrogen (green gas)

Biomass

Small hydro

Wind and Solar

Geothermal

Generator

Microgrid/solar/fuel cells

Rooftop solar

Solar Canopies

Community Solar/microgrid
Green Privilege

- Energy efficient residence
- Access to solar (rooftop or community solar subscription)
- Net metering payments offset total bill (including night usage)
- Walk or cycle to work, school, leisure activities
- Net zero lifestyle, access to EVs, public transportation are options
- Organic food available from garden, farmers market, local suppliers
- Native, drought-tolerant plants in garden
What about our social compact for universal service?

- Substandard housing increases energy burden. Roofs may not support solar
- Many consumers do not have cash flow for community solar subscriptions
- Long commutes in older vehicles and less efficient public transportation
- Subsistence lifestyle in food deserts
- Mobile homes not eligible for weatherization subsidies
- Landlords may not invest in EE measures, electrification, charging stations
- Cross subsidies for solar NEM, last to be reliant on natural gas
Affordability & Reliability Need Varied Resources

Duck Curve: Over-Generation + Evening Ramp

Excess daytime solar is curtailed
Overnight Supply in California

Current supply as of 21:30:
- Renewables: 7.4% (1,857 MW)
- Natural gas: 42.3% (10,649 MW)
- Large hydro: 10.0% (2,520 MW)
- Imports: 35.9% (9,045 MW)
- Batteries (charging): 0.0% (-9 MW)
- Nuclear: 4.4% (1,115 MW)
- Coal: 0.1% (15 MW)
- Other: 0.0% (0 MW)

Current renewables as of 21:30:
- Solar: 0.0% (0 MW)
- Wind: 14.2% (264 MW)
- Geothermal: 40.2% (747 MW)
- Biomass: 18.5% (343 MW)
- Biogas: 10.6% (197 MW)
- Small hydro: 16.5% (306 MW)

CAISO November 22, 2019 9:35 PM
Morning Resources in California

Current supply as of 07:00

- **Renewables**: 10.1% (2,229 MW)
- **Natural gas**: 39.0% (8,583 MW)
- **Large hydro**: 7.6% (1,663 MW)
- **Imports**: 37.6% (8,283 MW)
- **Batteries**: 0.5% (114 MW)
- **Nuclear**: 5.1% (1,121 MW)
- **Coal**: 0.1% (16 MW)
- **Other**: 0.0% (0 MW)

Current renewables as of 07:00

- **Solar**: 4.7% (104 MW)
- **Wind**: 22.4% (499 MW)
- **Geothermal**: 33.5% (747 MW)
- **Biomass**: 15.3% (340 MW)
- **Biogas**: 10.1% (225 MW)
- **Small hydro**: 14.1% (314 MW)

CAISO November 28, 2019  7:06 AM
Morning Resources in New England

FUEL MIX

- 41% NATURAL GAS
- 40% NUCLEAR
- 10% RENEWABLES
- 9% HYDRO
- <1% OTHER

MARGINAL FUEL: NATURAL GAS

Updated: 01/04/2020 03:53 AM

ISO New England, Jan. 4, 2020, 6:50 AM
2020: We are at an inflection point

Four steps towards a clean, equitable transition

https://www.anewrealitybook.com/
1. Adopt Hourly Carbon Accounting (Match Load+Supply)

Palo Alto is 100% Carbon Neutral only on annual basis

Natural gas and imports make up short fall

Overgeneration must be curtailed or sold (merchant risk)
2. Hybridize Long-Duration Thermal Generation and Storage

- Enhance existing gas power and peaker plants with flexible, dispatchable storage
- Potential to reduce carbon impact immediately by 50%
- Increase utilization of renewables while avoiding curtailment
- Provider dispatchable buffer so privately-owned DERs contribute to common supply
3. Decarbonize the gas supply

- Reduce carbon content further with lower carbon fuels
- Hydrogen and renewable bio fuels are being commercialized
- Excess solar being studied to produce hydrogen more cost-effectively
- Easier than replacing existing infrastructure
4. Socialize Cost of 24x7 Community Reliability

Off-grid

Grid-connected solar/EV customers

Non-solar customers

LMI ^
LET’S TALK RATIONALLY ABOUT A GREENER ENERGY FUTURE

Delivering on aspirational decarbonization goals

By Judith Schwartz, To the Point

There is no question that we are at an inflection point for a clean-energy transition. The public's enthusiasm has been captured. We've seen the emergence of passionate young activists and a grassroots action network that has helped to elevate climate change as a top priority for voters. Amidst these developments, however, there are challenges and complexities that require careful consideration.

The role of aspirational targets

Aspirational targets are critical for motivating action. However, it is problematic to set long-term targets without also considering current capabilities and the laws of physics. While it is true that we must think big and aim high to address climate change, it is also important to establish realistic milestones and timelines.

There is a tendency to treat long-term targets as a panacea, even though their feasibility and achievability are uncertain. This approach often leads to a slow and incremental pace, which may not be enough to achieve the necessary scale of change. It is essential to establish meaningful and achievable short-term goals to build momentum and gain support.

Let’s define the terms:

- 100% carbon neutral means net zero emissions, achieved through a combination of renewable energy, energy efficiency, and carbon capture and sequestration technologies.
- 100% renewable energy means that all electricity, heat, and transportation fuel needs are met by renewable sources.

Resolutions are expressions of ambition and ideals, intended to maintain credibility and instill hope in the face of uncertainty. They should not be confused with engineering or economic mandates that can sometimes be unrealistic.

Resolutions by definition are aspirational and do not mean the same thing as legal requirements. They are a way to signal commitment and to inspire action. The key is to set clear, measurable goals and to track progress over time.
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New York Climate Leadership and Community Protection Act (CLCPA)

• Caps statewide greenhouse gas emissions in 2050 at 15% of 1990 total
  – 1990 total was 236.19 MMTons CO2e
  – Therefore, \( \text{2050 GHG budget} = 35.42 \text{ MMTons CO2e} \)
  – 2016 total was 205.61 MMTons CO2e
• Other goals….
  – 6 GW distributed solar by 2025
  – 185 T Btu energy reductions compared with 2025 forecast via energy efficiency
  – 3 GW energy storage capacity by 2030
  – 9 GW offshore wind by 2035
Agenda

• Electric Rates – Modernization, Affordability, and Greenhouse Gas Reductions

• Natural Gas Stranded Cost Risk – Planning for Future Affordability
Electric Rates
Flat electric pricing does not improve affordability for most low income customers.
Time- Variant Pricing (“TVP”)

- Time of Use (“TOU”)
- Three-part rates/demand charges
- Critical Peak Pricing
- Real-Time Pricing (for Supply)
Real-Time Pricing

9/18/2018 – Real-Time LBMP & Actual Load

Click and drag in the plot area to zoom in

Source: New York Independent System Operator (NYISO)

Notes:
- Actual Load includes losses
EDF/Citizens Utility Board (CUB) Study

• Tested whether flat pricing is protective
  – Most customers studied would have done better on dynamic pricing, even without changing behavior.
  – Low-income customers generally did as well or better.

• Resulting recommendations
  – Allow access to anonymous energy-usage data
  – Adopt opt-in real-time pricing
  – Investigate a transition to opt-out real-time pricing
  – Investigate various dynamic pricing structures
  – Focus on helping customers lower their “coincident peak”
TVP + carbon pricing?

• A robust cost of carbon that generators had to pay would be expected to lower emissions of generation.

• Coupled with a real-time pricing tariff, this can be a pathway for sending a meaningful environmental price signal to retail customers.
Natural Gas Stranded Cost Risk
New York GHG Sources

Figure S-4. 2016 CO₂ Emissions from Fuel Combustion by Fuel Type

CO₂e = carbon dioxide equivalent
GHG = greenhouse gas

Total CO₂ from Fuel Combustion: 166 Million Metric Tons (81% of Total GHGs)

- Residual Oil: 2%
- Coal: 2%
- Electric Imports: 2%
- Other Petroleum: 2%
- Aviation Fuel: 6%
- Distillate Oil: 7%
- Diesel Fuel: 8%
- Gasoline: 28%
- Natural Gas: 43%

GHG Emissions from Fuel Combustion:
- Carbon Dioxide: 99%
- Other Gases: 1%

Source: New York GHG Inventory (July 2019)
Overview of Stranded Value

- **Value to be Recovered (% of Original Investment)**
- **Asset Value Already Recovered**
- **Asset Value to be Recovered**
- **Stranded Value**

Timeline:
- **Today**
- **No Longer “Used and “Useful”**
- **Planned End of Useful Life**

**Electrification Transition**
1. Consider requiring all new residential and commercial construction to be all-electric.
2. Clarify that a gas utility’s “obligation to serve” could be met with alternative fuels, such as targeted electrification.
1. Initiate interagency, integrated long-term planning for gas demand, infrastructure, and the transition of the delivery system.
2. Consider requiring all new residential and commercial construction to be all-electric.
3. Identify alternatives to significant new investments in the gas delivery system.
4. Anticipate and organize a just transition for the gas delivery system workforce.
5. Ensure that low-income and disadvantaged communities benefit from and are not burdened by the gas transition.
6. Clarify that a gas utility’s “obligation to serve” could be met with alternative fuels.
7. Consider aligning financial recovery of new gas infrastructure investments with the time horizons determined in the integrated long-term gas infrastructure plan.
8. Consider ratemaking adjustments to cushion the impact of the transition on customers.
9. Explore external funding sources to recover gas transition costs from sources beyond gas utility customers.
Thank you!

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Making an Impact
• VEIC

• Nonprofit founded in 1986
• 300+ Employees
• Locations: VT, DC, OH
• Design, deliver, and evaluate programs nationwide:
  – Energy efficiency
  – Transportation
  – Renewable energy
• Energy Justice

Our Customers:
• Utilities
• Businesses
• Government
• Foundations
• Environmental & Consumer Groups
What is the Sustainable Energy Utility?

- Clean & Affordable Energy Act (2008)
- Ratepayer-funded, privately operated
- Performance-based contract to DOEE
- Designed to help District households, businesses, and institutions save energy and money through energy efficiency and renewable energy programs.
DCSEU Goals

- Electricity Savings
- Gas Savings
- Green Jobs
- Local Economic Development
- Low-Income Spending & Savings
- Renewables
Investing in Low-Income Communities

- 20% of DCSEU spending
- 10% of overall energy savings
- Incentives and Technical Assistance in Affordable Multifamily Housing, Clinics, Shelters
- Energy Conservation Kits through LIHEAP Program
Solar for All

► Single-Family Solar at No Cost
► Community Renewable Energy Facilities
Workforce Development

“The DCSEU helped me get over the fear of getting back out into the workforce, by giving me the opportunity to learn some new skills and develop a certain confidence that I can go out there and compete in today’s job market.”

— Andre Roberson
DCSEU Workforce Development Extern
Impact Since 2011

$39+ Million Invested in Energy Efficiency and Renewable Energy in Low-Income Communities

$1 Billion In lifetime energy cost savings for DC residents and businesses

6.2 Million Tons of GHG emissions prevented

600+ Green Jobs Created for District Residents

600 Solar Systems For Low-Income Residents
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