MWCOG Built Environment & Energy Advisory Committee (BEEAC)
Meeting Summary: July 17, 2014

Attendees:
Emil King, DDOE (Co-Chair)
Kyle Haas, MEA
Kristen Ahearn, MEA
Whit Fulton, Infinite Invention
Tim Stevens, Sierra Club
Tyler Espinoza, Optony
Linen Ding, Optony
George Nichols, DCSEU
Michelle Vigen, Montgomery County DEP
Jeffrey Bond, Prince George's County
Bill Eger, Alexandria
Sosina Tadesse, DDOE
Bill Wolfe, Atlantic Energy
Tony Licata, Atlantic Energy

Phone:
Lisa Orr, Frederick County
Jeannine Altavilla, Arlington
Randy Wellerford, Loudoun
Andy Belden, Meister Consulting Group

Staff:
Jeff King, COG DEP
Maia Davis, COG DEP
Leah Boggs, COG DEP
Isabel Ricker, COG DEP

1. Call to order, *Emil King, DDOE, Chair*

2. Regional Solar Laws, Policies and Incentives, *Isabel Ricker, COG DEP*

Isabel gave an overview of the region's solar market, current deployment numbers and various policy differences across the region.

According to our 2013 utility data survey, the region had about 4,600 net metered solar PV systems amounting to 49.5MW of power as of December 31, 2013. This is over 1000% growth since 2005, when COG began doing the utility survey.

- Prince George's County and Montgomery County have the highest levels of solar deployment with 17.7MW and 16.3 MW respectively. Washington, DC comes in third with 7.8 MW.

The local market is shaped by policies, programs and incentives:

- Renewable Portfolio Standards – set REC price (especially if have a solar carve out)
- Net Metering – system and aggregate program caps have a big impact on the market, as do standby charges and whether virtual net metering is allowed
- Rebates and Tax Credits (Federal, state, local)
- Financing options available – whether third party ownership models (leasing, power purchase agreements) are legal, whether there is PACE financing

DC and MD both have a mandatory RPS with a solar carve out.

- Both states aim to achieve 20% renewable energy by 2020.
- DC has a very robust SREC market, with a current price around $480 (per MWh). MD's SRECs are around $130 (per MWh).

DC and MD also have government-provided rebates available, as well as tax credits for solar PV. VA passed a law last session that goes into effect in January that will exempt solar equipment from the punitive manufacturing and tools tax, which solar advocates and homeowners hope will help the economics work. VA also does not allow third party ownership through leasing or PPAs, except in certain Dominion pilot programs.

DC has a fairly small net metering cap (1MW per system) compared to most solar markets, but VA's cap is tiny at 20kW for residential and 500kW for non-residential systems.

DC and MD have virtual net metering, which in DC is referred to as "community net metering" and is available to all customers, with a 5MW per system cap. In MD it is called aggregate net metering and is only available to agricultural, municipal and non-profit customers, up to 2MW. Allowing virtual net metering will be instrumental in opening the market to renters and those with unsuitable roofs.

One of the newer methods for purchasing solar that is enabling more people to afford it and manage the process is bulk purchasing.

- This can be called "solar coops" or cooperative purchasing, community purchasing, or aggregate purchasing, so there is often confusion with virtual net metering policies.
- Bulk purchases are available to any customer type and can save 20-30% on system cost.
- They also encourage more people to buy solar by lowering the price the bigger the group, and setting a deadline to participate
- Solarize programs and Community Power Network (DC SUN, MD SUN, etc.) are prevalent models

The result of all these policies and incentives is a huge price differential. In DC, payback for a typical 5kW system is approximately 4.8 years, in MD is 9.3 years, and in VA is 19.5 years.

Current Solar Market Conditions, *Tyler Espinosa, Optony*
Optony is working in the region to help local governments achieve their solar energy goals both through policy improvements and solar procurements for government facilities. They are also helping with community purchases through solarize programs, including Solarize Blacksburg, Solarize Roanoke and Solarize Charlottesville.

Bulk purchasing (solarize) can be used by residential, commercial, non-profit, municipal customers
- They have achieved 10-40% cost reductions
- Municipal purchases usually achieve 10-15% savings

Municipal Aggregation and Procurement
Several large municipal purchases have grown out of work Optony did under a EPA Green Power Communities grant through COG:
    - DC DGS released an RFP in the spring for PV on numerous sites, abut 10MW
    - Montgomery County RFEPs: PV and Microgrid from DGS and PV from DOT

Optony also helped organize and pull off a multi-agency collaborative procurement in San Francisco Bay area, which was led by Alameda County:
    - 187 sites, 31MW distributed, counties, cities, universities
    - In mature market, commercial scale prices at ~$3/watt (quite low)
        - In other markets, still looking at ~$5/watt
    - PPA – seen prices in range of 4-5 cents per kWh
        - West Coast has had these prices for a while, but mid-Atlantic getting these now

Current and forthcoming market conditions
- Cost comparison with Germany – soft costs are really driving the differential, not hardware
- Rooftop Solar Challenge is aimed to help fix this
- Median install price has decreased dramatically
- Module prices likely to increase – estimated at 14% increase this year
    - ➔ Historically low cost right now
    - ➔ Short term install price declines likely to slow
    - ➔ New supply constraints and solar import tariff
    - ➔ ITC expires in 2 years, it takes about 2-2.5 years to complete a municipal aggregation

Innovative Solar Financing, *Andy Belden, Meister Consulting Group*
There are now several investment vehicles being used to expand supply of capital, lower cost of capital, lower soft costs, and reduce friction in the market.
    - There is motivation to apply new financing vehicles to solar because solar projects attain a higher than deserved cost of capital. Solar is relatively low-risk and predictable over time, but still seen as a relatively uncertain investment.

- Another motivation is the ITC expiration – this is the 30% federal tax credit, expected to expire January 1, 2017. Solar companies and customers are now looking for new ways to make solar possible to finance without this incentive.
- "Innovative" is a misnomer, these are well-established financing models used for other markets, that are now being applied to solar.

Opportunities Municipalities

- Direct ownership
  - Relatively low-cost debt capital, may be the best option even though can't take advantage of the ITC
- Third party ownership
  - Other party owns, operates, decommissions system
  - Customer gets electricity use, environmental benefits

Most innovative financing will affect the third party model

- 100s of billions of dollars that could be invested in renewable energy
- Aggregation is key
- Master Limited Partnerships (pipeline development, mining development)
  - Tax-advantaged structure that allows investment at partner level, no corporate taxes, can be traded on markets just like stocks
    - Could theoretically do an equity investment in solar
  - Long-term stable dividends
  - Not currently available to solar - Sen. Coons trying to expand definition of MLPs to solar
- Real Estate Investment Trusts (REITs)
  - Similar tax and liquidity benefits, traded
  - IRS recently clarified REIT uses, not as advantageous to solar as hoped
  - Some are trying to use the model, may not work
- Securitization
  - Bundle small loans into bonds
  - Large investors are much more interested in this size investment
  - Mortgages, cars loans, etc. are sold this way
  - Solar City is doing this with some of their investments
  - NREL working on standardization for solar contracts
    - In order to package, contract terms need to be quite similar
- Green Banks
  - Connecticut, New York, New Jersey
  - State support model for investments
  - CFEIA – active
    - Running PACE loan program
  - New York Green Bank – recently launched
    - Credit support to help move loans from bank to secondary market
  - NJ – developing structure and goals

- Energy resiliency bank to support energy security resilience

3. Maryland Game Changers Program

The Game Changer program targets top level technology readiness – newer technologies, but market-ready not in R&D stages. Doug Hinrichs initially had the idea for such a program that would help spur the clean energy technology market in MD.

- Called "market leading" technology
- MEA funds mitigate the risk of installing proven but not widely adopted technology
- The grant covers some incremental costs to buy down cost of the new technology
- The grant also evaluates the efficacy and applicability of the technology

Criteria for selection: Increases energy productivity, is cost effective, has market potential
Examples :

- First Commercial Solar Microgrid at Konterra plant in Laurel Maryland
- Solar hot water heating panel on affordable housing
- Solar EV charging station in Whitemarsh
- Geothermal financing, Living building challenge

This round's winners were a Solar + Storage project and a Meter Collar to reduce solar install costs. Both are distributed technologies for residential markets that will result in real installed projects.

2014 Game Changer Winner: Solar Meter Collar, *Whit Fulton, Infinite Invention*
Background on Infinite Invention:

- A home goes solar every 4 minutes, and the market is expected to keep increasing
- This growth is due to innovations in policy, finance and panels, but wiring and interaction with utility is still complicated and has not changed much as the market has grown.

Infinite Invention's ConnectDER meter collar:

- Allows plug and play – simply plug the solar panel wire into the meter collar
- Service panel installation for solar PV is very expensive, this avoids need for it
- The Meter Collar is effectively utility asset
    - Revenue grade meter, can be used to calculate feed in tariffs or a value of solar tariff
    - Can interact with inverter, which means it is a grid-ready asset that the utility could use on contractual basis e.g. for frequency and voltage regulation
    - Embedded communications so it can share information on energy production with utility and customer/homeowner
- Overcurrent protection, easy connection points, simple circuit breaker switch may qualify as AC disconnect – redesign may clarify the disconnect with air gap
- Infinite is hoping to sell the ConnectDER to utilities. The utility would install the meter before customers go solar, so that a solar installer could simply plug in the panels

MEA Game Changer 2.0 Grant project:

- 10 homes in MD, in conjunction with Pepco and Standard Solar, as well as Bill Brooks (Solar and NEC Code Expert)
- Prep will be complete in July, installation will take place August-September

4. Maryland Resiliency Through Microgrids Report, *Kyle Haas, MEA*

Yesterday (July 16) Obama announced a $1.2 billion fund for resiliency efforts.

- Available to 48 states and many municipalities
- MEA sees this as an important step – this is a new focus, and new policies are emerging to address it

Climate Central (research/advocacy non-profit) predicts a 10 fold increase in power outages related to extreme weather. These events have a *quantifiable impact* on safety and the economy.

Microgrids

- MEA wants to get to a district-scale microgrid (past just single building).
- The technology exists to make the larger grid a series of interconnected microgrids
- Right now it is difficult to isolate areas of the grid
- Multiple properties and entities bring up many new legal and regulatory challenges
- MEA is focusing on Public Purpose Microgrids – for critical infrastructure and public goods
    - E.g. Silver Spring downtown, compendium of key and critical infrastructure

Technical and Financial Opportunities

- Using the internet: Auto disconnect, new ways to understand the electricity value and tap into new revenue streams
- Energy Storage: Helpful for integrating distributed resources and provide ancillary services to help grid stability
- Management software to manipulate integrate technologies

Stackable Benefits (maximize the benefits and value of the asset)

- Emergency islanding
- Peak Load Shifting
- Demand response
- Ancillary services
- Environmental & Social Benefits

MEA Strategies for Deployment of distributed energy resources (DER)

- Lower the costs and barriers of DER
- Compensate DER fairly for the next generation of energy service
    - Include other values, e.g. environmental and social benefits
- Safely and affordably integrate DER into the grid

MEA's Grid Transformation Program

- Decrease cost of DER
- Increase value of DER
- Safe, reliable, effective DER
- Look at legal and regulatory challenges of DER

Regulatory Challenges of DER

- Interconnection – there are limits and legal requirements when DER penetration on a substation area gets above a certain level
    - MEA is looking at how to speed up this process and reduce cost of feeder upgrades
- Incorporate Public Purpose Microgrids into emergency management planning
    - Process for using the asset and integration/interaction with the community

MEA is seeking feedback

- Step 1: Comprehensive review of all comments next week
- Step 2: Engage with PSC and other state entities to do a comprehensive policy and regulatory review
    - Better align needs of utilities and ratepayers
    - Enable projects to be economical
- Step 3: Collaboration with local governments

5. COG Climate & Energy Progress Report, *Maia Davis, COG DEP*

The 2014 Climate & Energy Progress Report draft has been released, comments are due by July 31.
The report was done a bit differently this year: DEP included a comparison to 14 other regions on several national climate or energy best practices and programs. We are doing quite well compared to other areas of the country! Before doing this comparison we had no way of knowing how we stacked up.

LEED – COG is in the top 4 (or the regions compared) on almost every LEED certification

- LEED for Homes and New Construction are generally always the most common around the country
- DC now has over 500 LEED buildings, approaching 100 million square feet of LEED space

Energy Star – COG is in the top 3 for number of buildings and floor space
Green Power Partners – COG is in the top 4 for metrics of participants (this is driven by Federal and local government participants)

*If anyone is interested, data is available for each locality in the above programs, as well as Annual Climate & Energy Survey results (email Maia at mdavis@mwcog.org)

6. Virtual Net Metering for Commercial and Municipal Customers, *Bill Wolfe, Atlantic Energy*

Atlantic Energy: focuses on Large Commercial, Industrial and Municipal solar systems 5 MW and up

- Represents Solar City, which has recently dedicated $400 billion to invest in solar
- Working with BRICPAC – Baltimore regional cooperative purchasing committee
    - Purchase 340MW power annually, $100 million/year energy costs
    - Helping them do a 10MW solar project in central MD (remote ground mount)

Aggregate Net Metering in MD

- Can deliver solar to up to 20 meters, with a 2.4MW per meter delivery cap
- Large, ground mount systems are great, but roof-top can work as well
- The energy is delivered to a third party PJM account holder
- 1MW is smallest increment allowed, but the electricity can be bundled and then delivered to one or many customers

These projects are possible because of Solar City's financial backing and advantageous contract terms

- 20 year PPA with quite low per kWh cost (and zero escalator, same price for 20 years)

7. Roundtable Updates

Michelle Vigen, Montgomery County:

- DGS is hiring a solar manager for their new projects
- County Council committee is looking at draft PACE legislation on Monday (July 21)
- Having IgCC code discussion with permitting staff

Lisa Orr, Frederick County:

- Working on a solar array on County landfill
- Launching power saver retrofit program

8. Next Meeting dates

- CEEPC Meeting – July 23, 2014
- Green Streets Workshop – July 28, 2014
- BEEAC Planning Call – September 4, 2014
- BEEAC Meeting – September 18, 2014
- CEEPC Meeting – September 24, 2014
- EcoDistricts Training – September 24-26, 2014