



Selling Electricity to the Grid and the Value Stack Rate Tariff

Allison Muehe, PE, LEED AP
amuehe@antaresgroupinc.com
(315) 445-2237 ext. 303

James Olmsted, PE, CEM, LEED AP
jolmsted@antaresgroupinc.com
(315) 445-2237 ext. 304

December 13, 2017



Lanham, Maryland

Harrisonburg, Virginia

Fayetteville, New York

www.antaresgroupinc.com

Main Topics

- Electricity Sale Method
 - Prior to and as a result of VDER
- Value Stack Tariff
 - Components
 - Rates summary
- Case Study



Changing Electricity Sales

- Current Electricity Sale Method
- What has Changed?
 - REV
 - VDER
 - Tariffs



Current Electricity Sale Method

Generate
Power

1

Use On-
Site

2

Direct Sale
to Nearby
User

3

Export/Sell
to Grid

Working??



What has Changed?

- **What:** Reforming the Energy Vision (REV)
- **Who:** Governor Cuomo
- **Where:** NYS
- **When:** REV announced on April 24, 2014
- **Why:** changing technology, risks, and challenges
- **How:** encourage on-site power systems and advanced energy management



What has Changed?

Regarding Electricity Sales

- **What:** Value of Distributed Energy Resources (VDER)
- **Who:** NY PSC to direct Utilities
- **Where:** All of New York State except Territory of the Long Island Power Authority
- **When:** Major orders issued March 9, 2017 & September 1, 2017
- **Why:** Compensation mechanism to include locational and environmental benefits to spur renewable electric generation
- **How:** Through open proceeding in case 15-E-0751

What has Changed?

- Previously
 - Wholesale rate ~NYISO day ahead location based marginal pricing
- Value Stack Tariff
 - Components set by NYPSC, some specifics set by Utilities
- What is changing
 - Method of determining sale rate, when energy netted for credit, and continuous rollover
- Why?
 - Transparency; account for additional benefits



Electric Generation and Sale

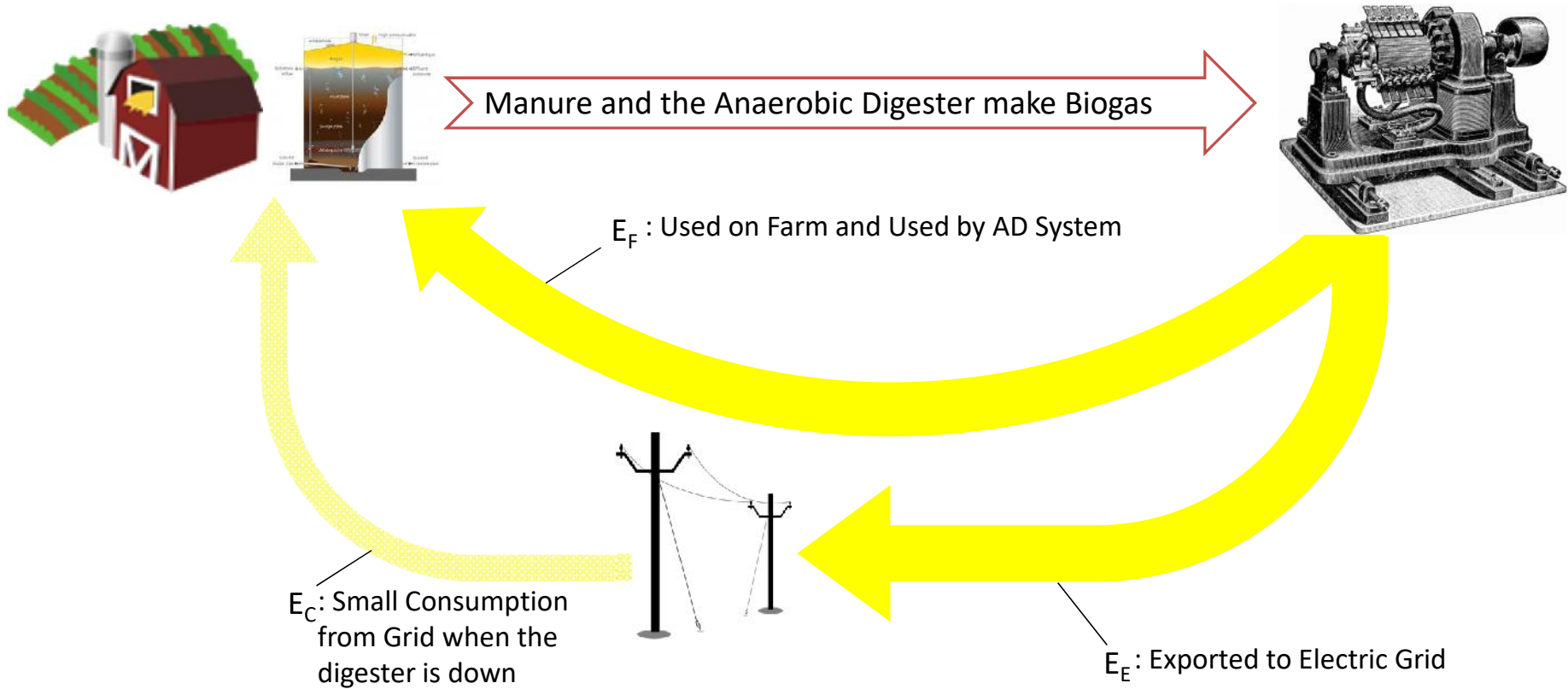
- Options
- Remote Net Metering
- ADG Project Impacts



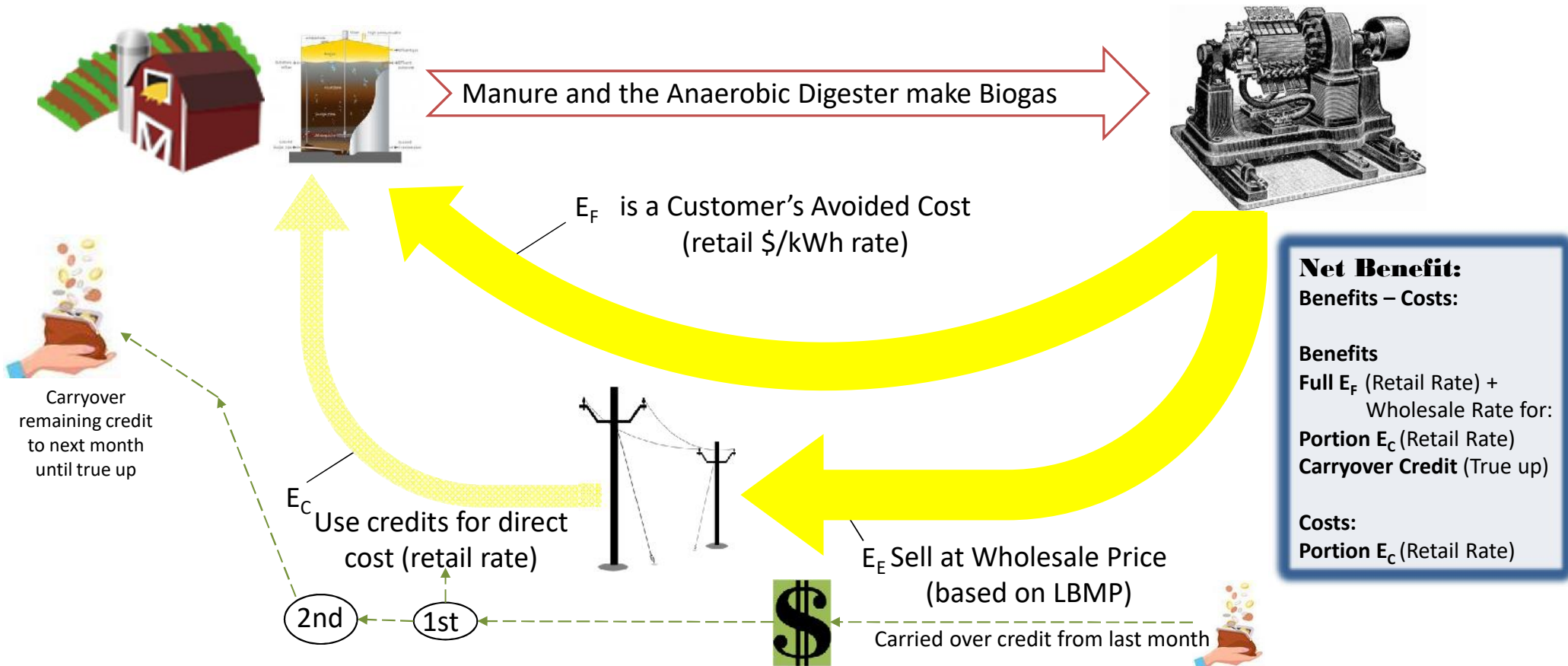
Considerations for ADG Systems

- Ability to generate versus need
- Size of farm and electricity needs
 - Availability of other feedstocks
 - Overall Demand and Rate Class
- Interconnection options
 - Location, location, location!
 - One way/sale only
- Satellite accounts or other community members (CDG)
- Need for hot water
- Direct sale opportunities

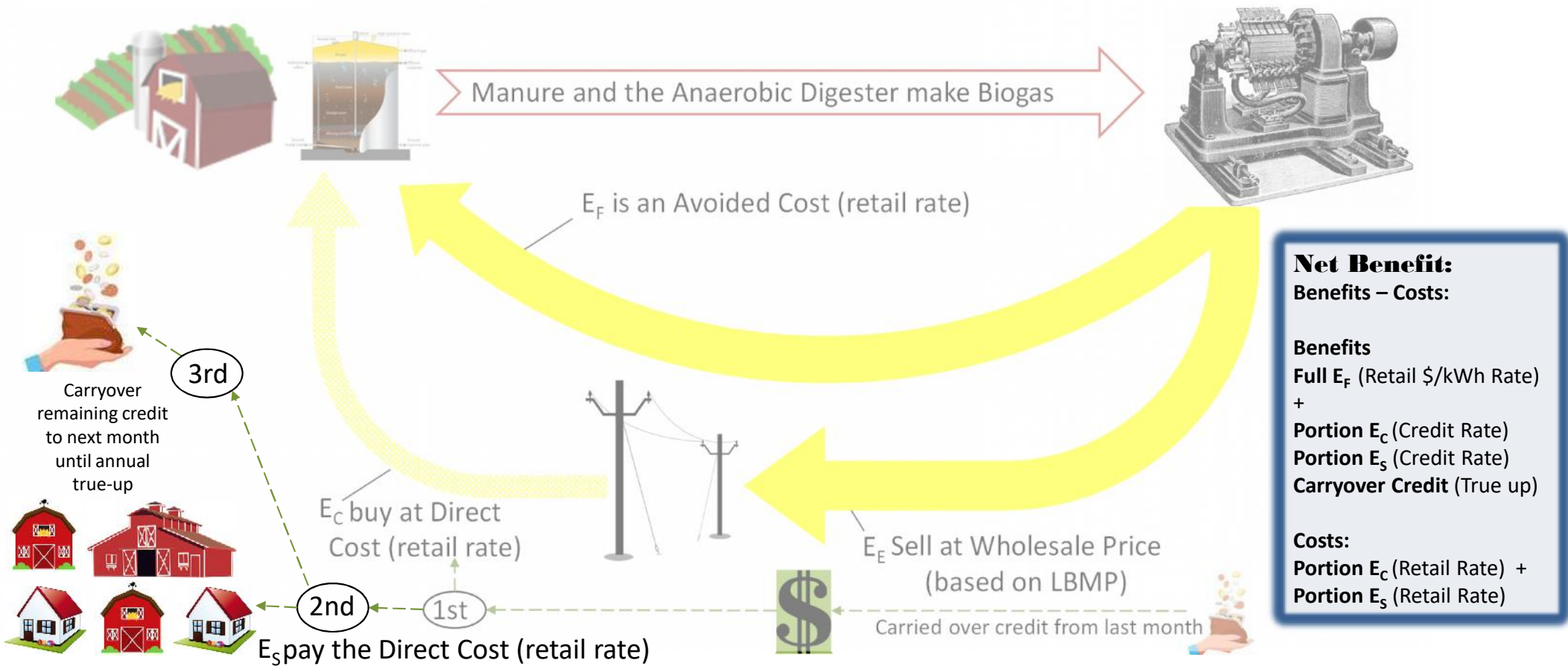
Net Energy Metering (NEM)



NEM Earnings & Fee Application



Remote NEM Earnings & Fee Application



RNEM Compensation Methodology

- Rates based upon the NYISO day ahead location based marginal pricing (DA LBMP)
- Hourly rates apply to use
- Credits are used within the billing period to cover costs
- Excess credits rolled over each month and paid out at end of year (true up)
- Credits used to pay satellite utility bills prior to roll over



Remote Net Metering

Majority of Farms

- Benefits
 - Satellite account paid
 - Rollover
 - Based on host account
 - Volumetric has larger value than monetary
 - True up
 - Rollover value at month 12
 - Payment in the form of a check

Host Meter Classification	Crediting Method
Non-demand	Volumetric (kWh)
Demand	Monetary (\$)



VDER Compensation Methodology

- Value Stack Methodology based on adding (stacking):
 1. Energy Value
 2. Installed Capacity Value (ICAP)
 3. Environmental Value
 4. Demand Reduction Value (DRV)
 5. Locational System Relief Value (LSRV)
- Overall rate has large range due to components regional differences
- Market transition credit (MTC) to fill gap between retail rate only for Community Distributed Generation projects (CDG)

Described in Case 15-E-0751, Staff Report and Recommendations in the Value of Distributed Energy Resources Proceeding; Section 2.5

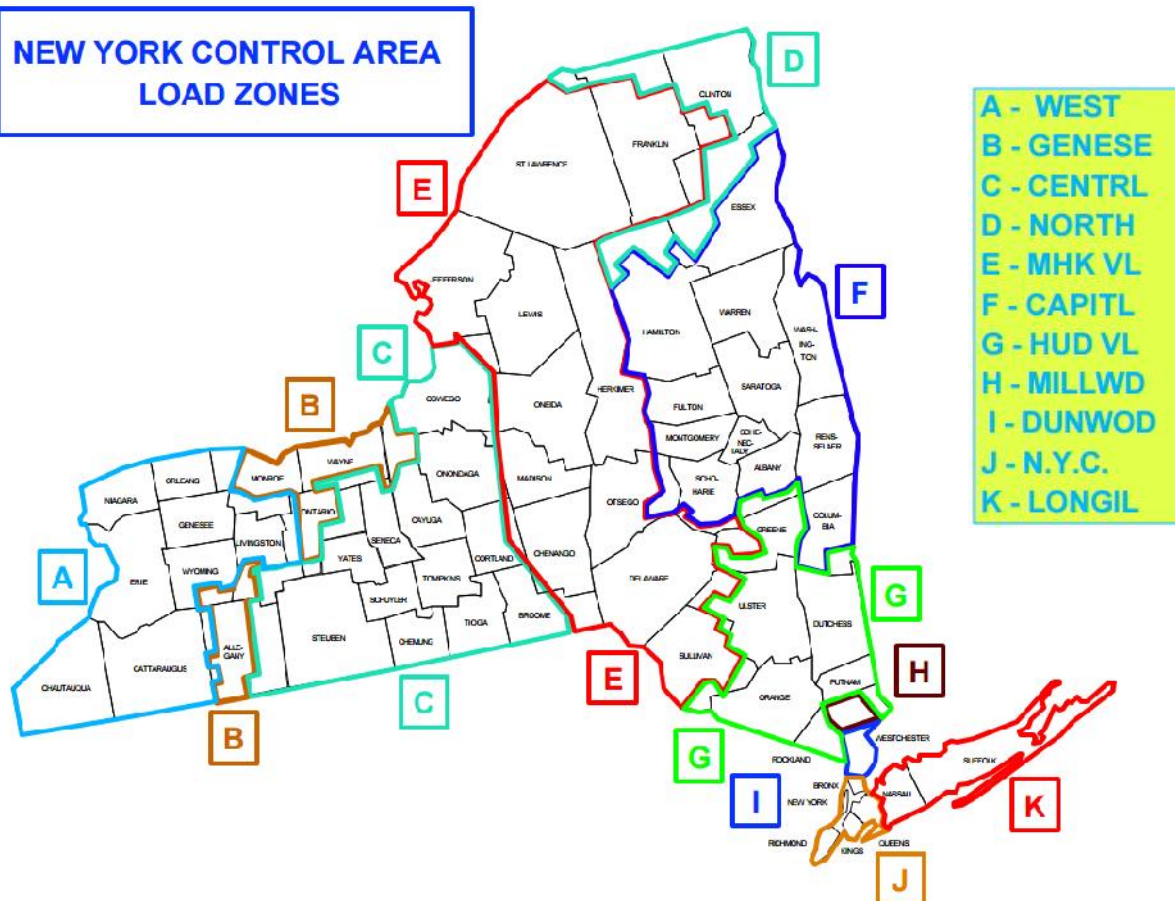


VDER: 1) Energy Value

**Energy Value = NYISO
hourly DA LBMP**

Example:

- Region: Central Region (C)
- Time Period: 2016
Calendar year
- Value Range:
\$0.0013/kWh to
\$0.0929/kWh
- Average Value:
\$0.0216/kWh



VDER: 2) ICAP

Supply Services

SUPPLIER National Grid

Hourly Electricity Supply

Merchant Function

0 x 0 kWh

Capacity Tag Charge

4.31181 x 404.02 kW

Total Supply Services

- Value of meeting required electricity supply to the NYPP or ISO
- Value Stack Capacity Component (Alternative 3 Method)
- Calculated using demand peak in the previous year
- Similar to National Grid's capacity tag charge demand
- NYISO spot market auction clearing price for UCAP in \$/kW-mo
- Unforced capacity (UCAP)
- 2016 monthly values ranged \$0.35 /kW to \$5.27/kW per month

VDER: Other Values

3. Environmental Value: Accounting for carbon emission reductions

“price of Tier I Renewable Energy Certificates (RECs) in NY’s markets.”

The current rate is \$0.02424/kWh as published by PSC on 03/09/2017

4. Demand Reduction Value (DRV) and 5. Locational System Relief Value:

“a monthly lump sum based on the project’s kW performance during [the local peak] 10 hours in the previous year.”

NYSEG: DRV \$29.67/kW annually LSRV: \$21.82/kW annually to \$56.26 per kW annually

National Grid: DRV \$5.12/kW annually LSRV: \$2.56/kW-month (\$30.72/kW annually)

Examples: DRV ranged from \$0.0034/kWh to \$0.0056/kWh

LSRV ranged from \$0.00/kWh to \$0.0033/kWh

VDER: Adding it All Up

Rates for NYISO Regions A-F

Component	Value or Range (\$/kWh)
Energy Value	0.00128 - 0.0929
Installed Capacity Value (ICAP)	0.005 - 0.0649
Environmental Value	0.02424
Demand Reduction Value	0.0034 - 0.0056
Location Service Relief Value	0.00 - 0.0033
TOTAL RATE	0.034 - 0.19

Described in Case 15-E-0751, Staff Report and Recommendations in the Value of Distributed Energy Resources Proceeding; Section 2.5



Electricity Sale Method under Value Stack

Generate
Power

1

Use On-Site

2

Direct Sale
to Nearby
User

3

Export/Sell
to Grid with
Value Stack

4

Community
Distributed
Generation
with Value
Stack



Remote Net Metering vs. Value Stack

Differences

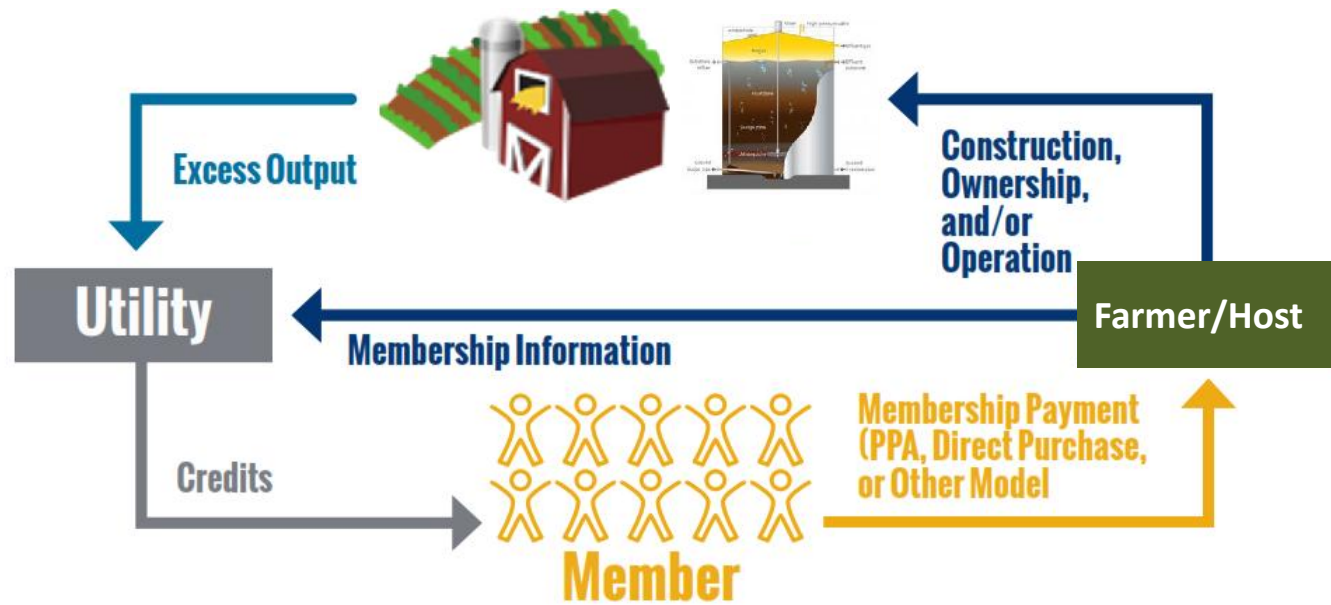
- Tariff
- Rollover
- CDG



Community Distributed Generation

Community DG Roles and Responsibilities

- Brief description
- Benefits
- Challenges



What does this mean for ADG Projects?

- Existing Projects
 - Opt In for VDER or stay with R/NEM
- New Projects
 - All have value stack
 - Can choose method
 - Individual net meter or remote net meter
 - Buy All/Sell All (BASA)
 - Community Digester with CDG



Case Study

- Typical Farm
- Remote Net Metering
- Value Stack Projections



Case Study: NYSEG SC 12003P

Farm: Dairy

Location: Stanley, NY

ISO Region: Zone C Central

Utility Zone: Central

Cows: 2,450 milking

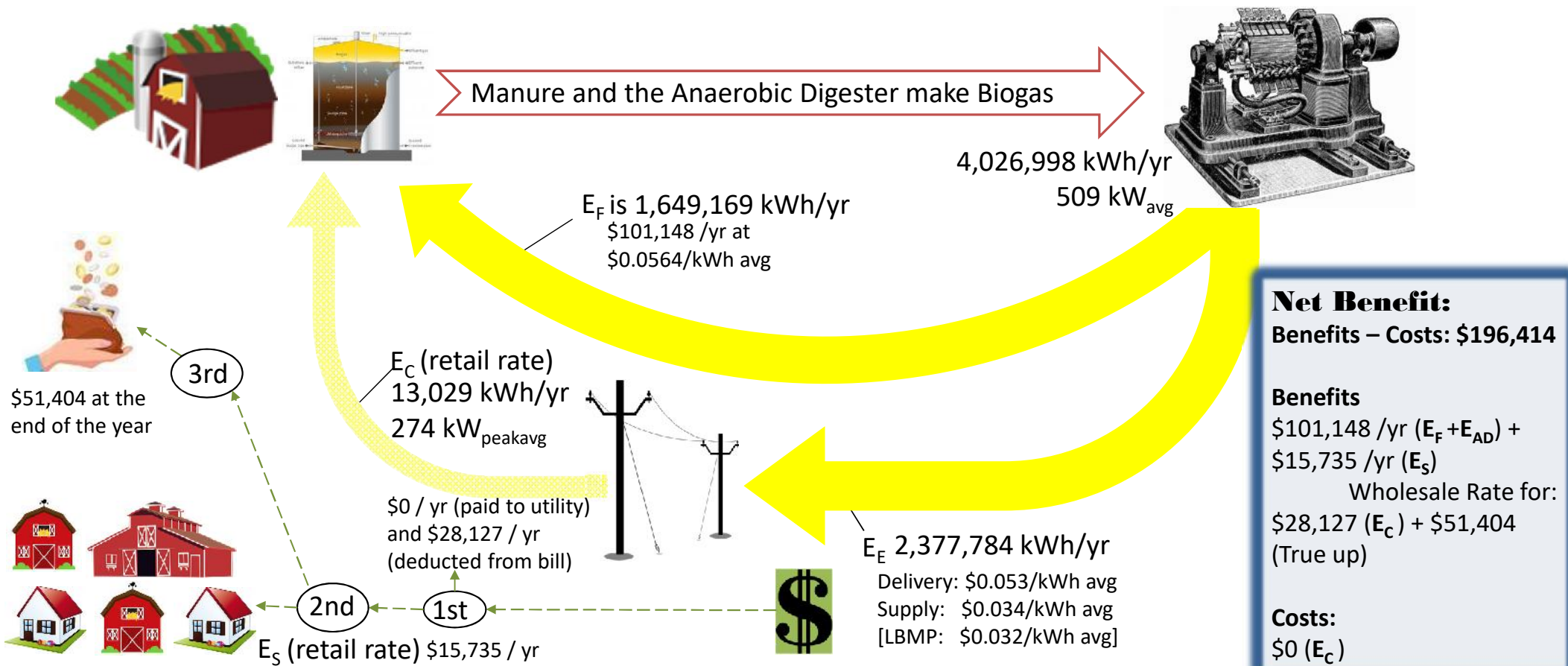
Additional Feedstock: Dairy Waste and Corn Silage

Engine Size: 541 kW

Transmission: Primary



Remote NEM Earnings & Fee Application



Net Metering Analysis Results

- *Billed usage: 13,029 kWh, 274 kW monthly avg*
- *Exported energy: 2,377,784 kWh/yr*
- *Estimated usage on farm: 1,649,169 kWh/yr*
- *Generation: 4,026,998 kWh/yr*
- Fees incurred: \$28,127
- Net credits to pay satellite accounts bills: \$15,735
- Annual payout: \$51,404
- Net benefit: \$196,414



Now using Value Stack?

- *Billed usage: 13,029 kWh, 274 kW monthly avg*
- *Exported energy: 2,377,784 kWh/yr*
- *Estimated usage on farm: 1,649,169 kWh/yr*
- *Generation: 4,026,998 kWh/yr*
- Fees incurred: \$28,127
- Net credits to pay satellite accounts bills: \$15,735
- Annual credit value: \$111,215
- Potential Net benefit: \$256,225



Summary: Important Takeaways

- Electricity tariff for ADG has changed to value stack, rate closer to commercial rates
- Environmental benefits considered
- Behind the meter use tends to be more advantageous
- Sale rate can be higher with value stack, overall economic model can be better with value stack

