## Value of DER

## Con Edison and Orange & Rockland

## Developer Workshop

July 24, 2017





DRAFT AND IN ACCORDANCE WITH UTILITY IMPLEMENTATION PLANS AS OF 7/24/2017

1

#### Housekeeping

#### In case of emergency

- Dial 911 or alert the Security Desk
- Con Edison's TLC Address: 43-82 Vernon Blvd, LIC, NY
- In the event of an emergency, audible alarm & visible strobes will be activated; follow announcement instructions
- Post evacuation assembly area is the 3<sup>rd</sup> row of the parking lot

#### Rest rooms

Located on the south side of the building & opposite the cafeteria

#### • Con Edison's Learning Center is a Smoke Free Facility

Designated smoking areas are in the front & rear of the building



2

#### Agenda

	Торіс
1:10 PM	Value of DER framework
	Phase One NEM and Mass Market Customers
	Value Stack components
	Tranche structure
	Timeline for implementation
2:30 PM	Q&A on VDER framework and Value Stack
3:00 PM	Break
3:20 PM	Tranche status
	Interconnection rules
	Metering requirements
3:30 PM	CDG Enrollment and Value Stack Billing
3:50 PM	Developer Journey
4:15 PM	Closing Q&A





### Introduction to the Value of DER

- Part of New York State's Reforming the Energy Vision
- Ordered by the Public Service Commission
- Calls for the transition away from Net Energy Metering (NEM) towards a values-based approach ("Value Stack")
  - Values can vary by location and time
  - The transition credit declines over the course of three subscription tranches



#### Outcome of Value of DER Order

Systems operating as of March 9	<ul> <li>No changes; receive NEM for life of system, can opt-in to new structure</li> </ul>
New residential & small commercial systems installed through sooner of January 1, 2020 or Phase 2 Order.	<ul> <li>Eligible for 20 years of NEM ("Phase One NEM")</li> </ul>
New large commercial and industrial, remote net metering installations	<ul> <li>Receive "Value Stack" without transition credit for 25 years</li> </ul>
New Community DG projects	<ul> <li>Tranche 0 receives NEM for 20 years</li> <li>Others receive "Value Stack" for 25 years with transition credit for mass market subscribers that declines by tranche</li> </ul>



#### VDER Framework



**Orange & Rockland** 

conEdison

6

DRAFT AND IN ACCORDANCE WITH UTILITY

**IMPLEMENTATION PLANS AS OF 7/24/2017** 

### **Phase One NEM: What's different?**

	NEM	Phase One NEM		
Eligible customers	All customers	SC 1 and 2 (non- demand billed)1All other service classes		
In service date	On or before 3/9/17 and Utility notified complete by 3/17/17	By 1/1/20 orNon-massPhase Two OrderBy 7/17/172		
MW limit	Ended as a floating cap	O&R: 25 MW n/a CE: 90 MW		
Eligible technologies	Solar PV, wind, micro-hydro, farm waste generation, fuel cells, micro-CHP	Same NEM eligible technologies, <b>plus</b> paired storage		
Credit value	Monthly n	et volumetric kWh		
Carryover	moi	nth to month		
Credit cashout	Annually for residential solar	lar None; credits carryover M-to-M		
Term	Life of system	20-years from in-service date		
Compensation after term ends	n/a	Transition to the most current structure in place at end of term		

<sup>1</sup> including SC 19 at O&R <sup>2</sup> interconnection >= 25% costs paid, if any, or interconnection agreement signed



DRAFT AND IN ACCORDANCE WITH UTILITY IMPLEMENTATION PLANS AS OF 7/24/2017

7

#### The Value Stack



Generating Capacity

Renewable Energy Credit

Demand Reduction Value

Market Transition Credit

Locational System Relief Value

All mechanisms, rates, and values shown in this presentation are subject to Commission approval





## Unpacking the Value Stack

Component	Description
Energy	Day Ahead Hourly LBMP
	Volumetric credit applied to
Installed	production in all hours with
Capacity	option for higher credit in
	summer on-peak periods
Environmental	NYSERDA REC or cost of carbon
	Applicable to customers not
Distribution	eligible for MTC
Relief Value	• Based on performance during 10
(DRV)	peak distribution hours of
	previous year valued at MCOS
Locational	Additional incentive for DER
System Relief	developed in high value areas
Value (LSRV)	based "stretch" of MCOS
Market	• Credit for mass market to bring
Transition	compensation close to NEM
Crodit (MTC)	Declines for new projects as
	tranches fill

1. Higher of NYSERDA REC value or EPA Social Cost of Carbon less RGGI

conEdison

Orange & Rockland







10

Orange & Rockland

conEdison



#### Generating Capacity

#### Intermittent

- Solar PV
- Wind
- Micro-hydro

#### **Dispatchable**

- Farm waste generation
- Fuel cells
- Micro-CHP
- Paired storage

	Alternative 1	Alternative 2	Alternative 3
Description	Per kWh; equivalent to capacity portion of utility retail rates SC 9 CSC 3	<b>Per kWh</b> ; concentrates credits during 460 summer afternoon hours	<b>Per kW-coincident</b> with prior summer capability period NYCA peak
Value updated	Every <b>November 1</b> and <b>May 1</b> based on ICAP strip auctions	Every <b>May 15</b> based on concentrating prior year's Alt 1 capacity rates	Every month based on ICAP spot auctions
Eligibility	Intermittent resources	Intermittent resources	Required for dispatchable resources Optional for intermittent resources

11





#### Generating Capacity Alt. 3 May 2016 sample rate (1000 kW export @ 2015 NYCA Peak)



	NYC	G-J	ROS	Total
1. UCAP Requirement	72.83%	82.86%	106.21%	
2. Excess Demand Curve	7.57%	4.81%	5.81%	
3. Net UCAP Requirement	78.34%	86.85%	112.38%	
4. Effective Requirement	78.34%	8.50%	25.54%	
5. Spot Clearing Price	\$12.41	\$9.39	\$5.27	
6. Weighted Price (\$/kW)	\$9.72	\$0.80	\$1.35	\$11.87
7. With 6.3% Line Losses				\$12.61

2015 Coincident Peak Export1,000kW\$1	2,610
---------------------------------------	-------

Location	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %
NYC	11,793.5	80.5%	9.53%	9,493.8	8,589.0	72.83%
G-J Locality	16,309.4	90.0%	7.93%	14,678.5	13,514.5	82.86%
NYCA	33,358.8	117.5%	9.61%	39,196.6	35,429.8	106.21%





## Generating Capacity rate eligibility and rules





Alt. 2 must be elected by May 1 to receive compensation in the following summer

13







conEdison

### Environmental credit

- A customer can retain their REC and forgo compensation through the Value Stack
- By default, the utility gets credit for the REC and the customer receives:

**Orange & Rockland** 



DRAFT AND IN ACCORDANCE WITH UTILITY

**IMPLEMENTATION PLANS AS OF 7/24/2017** 



# Demand Reduction Value & Locational System Relief Value

- Proxies for distribution value of DER
- Based on the avoided marginal cost of service
- Initially propose LSRV adder in high-value areas based on
  - © Orange & Rockland Planned investments to meet future load and contingencies
  - ConEdison Loading of sub-transmission and network/load areas
  - Projects in high value areas lock in LSRV rate for 10 years
- DRV applicable to projects (and subscribers) not receiving an MTC
- LSRV & DRV will reflect Marginal Cost of Service study updates





#### Locational System Relief Value 85 MW of need eligible



Sub-transmission	MW need
Plymouth	14.3
Water St.	30.1
Glendale, Newtown	8.1
Area Station	MW need
East 179th Street	7.8
Parkchester No. 2	6.8
Parkchester No. 1	0.7
W. 65th St. No. 1	1.5
Wainwright	7.2
Willowbrook	0.3
Millwood	3.8
Network	MW need
Northeast Bronx	6.8
Yorkville	4.5

#### LSRV MW caps by region







#### Locational System Relief Value 19% of Con Edison service territory load is in a high-value area





Crange & Rockland



Orange & Rockland

conEdison



#### Locational System Relief Value Initial year's value is based on NREL model of coincidence with prior year's 10 peak hours

		Con Edison			
	O&R NY	11A-3P CSRP Window	2P-6P CSRP Window	4P-8P CSRP Window	7P-11P CSRP Window
DRV (\$/kW-yr)	\$64.78		\$19	9.4	
LSRV (\$/kW-yr)	\$39.61	\$140.76			
Initial avg. coincidence with top 10 hours	17.62%	46.85%	32.15%	12.76%	11.58%
Initial DRV (\$/kW-yr)	\$ 11.42	\$ 93.42	\$ 64.1	\$ 25.45	\$ 23.09
Initial LSRV (\$/kW-vr)	\$ 6.98	\$ 65.95	\$ 45.25	\$ 17.96	\$ 16.3
LSRV + DRV (\$/kW-yr)	\$ 18.40	\$ 159.37	\$ 109.35	\$ 43.41	\$ 39.39

19



Crange & Rockland



conEdison

#### DRV and LSRV Sample calculation for 300 kW (nameplate) Solar PV



Date & Time	O&R NY load	Example output
9/8/2015 17:00	947 MW	90 kWh
7/20/2015 17:00	947 MW	120 kWh
7/20/2015 18:00	940 MW	30 kWh
9/8/2015 18:00	937 MW	15 kWh
7/20/2015 16:00	937 MW	210 kWh
7/29/2015 17:00	936 MW	30 kWh
8/17/2015 17:00	936 MW	9 kWh
7/29/2015 18:00	935 MW	21 kWh
8/17/2015 18:00	933 MW	12 kWh
9/8/2015 16:00	930 MW	150 kWh

Wtd avg = 68.74 kW

In this example:

- Avg 68.74 kW coincidence during 10 peak hrs
- DRV rate of \$64.78/yr per avg kW-coincident

68.74 kW \* \$64.78/kW-yr

= \$4,452.98 per year

Credited as \$371.08 per month, prorated by DRV eligible output

If the resource is in an eligible location, it would receive a monthly LSRV credit using the same coincidence 20





conEdison

## Market Transition Credit



Orange & Rockland

- Bridges the transition between NEM and Value Stack compensation for mass market customers
- Credits decline over time as MW tranches are filled (explained in detail later in this presentation)
- Projects eligible for MTC are locked into the rate for 25 years
- Distinct credits for SC 1 and SC 2 (nondemand billed) based on Commissionordered calculation
- Available to CDG subscribers and mass market onsite resources that opt into the Value Stack
- Not eligible for:
  - Remote Net Metering subscribers
  - Any kWh receiving DRV

# Value Stack: compensation mechanisms by component

			per kWh	per kWh in summer 460 hours	per kW- coincident with NYCA peak	per kW coincident with utility [or CSRP] 10 peak hours
	LBMP				1	
~	ICAP	Alt 1.	If elected (and eligible)			
Supply		Alt 2.		lf elected (and eligible)		
		Alt 3.			If elected or required	
	REC		if elected			
	DRV					Prorated by % of export not receiving MTC
Dist.	МТС		for eligible export		1	1
	LSRV					if eligible

22



# Value Stack: rate updates for in-service projects

			Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Supply	LBMP		hourly											
	ICAP	Alt. 1	→ Winter capability period price					Sumr	Summer capability period price				Winter c	apability →
		Alt. 2						460	hours: 2 -	6 PM				
		Alt. 3	monthly											
	REC							fixed for	25 years					
	DRV		\$ per kW-coincident updated every 2-3 years, project-specific kW-coincidence updated January 1 each year							ear				
Dist.	MTC		fixed for 25 years											
	LSRV		\$ per	kW-coinci	dent fixed	for 10 yea	ars (if eligil	ole), projec	ct-specific	kW-coinc	idence up	dated Janı	uary 1 eac	h year



ConEdison



#### Value Stack: example rates according to methodologies in Utilities' May 1 and May 15 filings

\*\*\*Subject to change & pending Commission approval\*\*\*



24

conEdison

Crange & Rockland

#### Valuation Example for Solar PV (demand-billed)



conEdison

### Valuation Example for CDG



26



Orange & Rockland

### Tranche Structure: CDG, Mass Market, Large C&I

Phase One NEM	O&R	Con Edison
Incremental Mass Market	25 MW	90 MW

VDER	O&R	Con Edison
Tranche 0/1	23 MW	137 MW
Tranche 2	12 MW	206 MW
Tranche 3	11 MW	205 MW

- CDG can qualify for Phase One NEM subject to the Tranche 0 cap & interconnection deadline (>=25% down payment or executed SIR contract by 7/17/17)
- Remaining capacity in Tranche 0, if any, will be available in Tranche 1
- Projects eligible for an MTC will be placed in the active tranche at the time of their interconnection >=25% down payment or executed SIR contract



## Timeline for implementation

- Public Service Commission issued VDER Order on 3/9/17
- Phase One NEM began for eligible projects entering service on or after 3/10/17
- Utilities filed Value Stack implementation plans on 5/1/17
- Commission ruling on implementation plans expected in the fall
- New compensation mechanisms and rates will go in effect following the order

## Q&A on VDER Framework and the Value Stack





## Break





DRAFT AND IN ACCORDANCE WITH UTILITY **IMPLEMENTATION PLANS AS OF 7/24/2017** 

30

#### Agenda

	Торіс
1:10 PM	Value of DER framework
	Phase One NEM and Mass Market Customers
	Value Stack components
	Tranche structure
	Timeline for implementation
2:30 PM	Q&A on VDER framework and Value Stack
3:00 PM	Break
3:20 PM	Tranche status
	Interconnection rules
	Metering requirements
3:30 PM	CDG Enrollment and Value Stack Billing
3:50 PM	Developer Journey
4:15 PM	Closing Q&A



#### Tranche Status

#### As of 7/15/17:

	Crange & Rockland	ConEdison
Incremental Mass Market Phase One NEM	2.9 out of 25 MW	21.9 out of 90 MW
Tranche 0/1	24 out of 23 MW	2.9 out of 136 MW
Tranche 2	12 out of 12 MW	0 out of 206 MW
Tranche 3	15 out of 12 MW	0 out of 205 MW





#### Interconnection Rules

- New York State SIR continues to govern interconnection for DG up to 5MW
- Phase One NEM and Value Stack compensation is limited to 2 MW per premise (micro-CHP limited to 10 kW)
- For more information:
  - <u>www.coned.com/solar</u>
     <u>www.oru.com/solar</u>
- Key milestones in interconnection process for VDER:
  - Application submittal
  - Interconnection agreement and/or payment of at least 25% upgrade costs
  - Final acceptance

conEdison



### Value Stack Interconnection Milestones

		Application submittal	SIR executed or 25% of costs paid	Final acceptance
$\geq$	LBMP			Credits begin upon production
Iddn	ICAP			Credits begin upon production
()	REC	Option to retain REC, if eligible	If Interconnecting-LSE- Option, rate locked in	25 year term begins
lion	DRV			Credits begin upon production
tribut	MTC	Eligibility determined	Rate (based on active Tranche) locked in	25 year term begins
Dis	LSRV	Eligibility determined	Rate locked in, if eligible	10 year term begins

ConEdison

Crange & Rockland

### Metering Requirements and Process

- Value Stack will require interval metering functionality
- Interval metering measures:
  - hourly import charged at the applicable SC rates
  - hourly export credited at the Value Stack rates
- Projects eligible for Value Stack rates will begin to receive credits after their meter is configured or upgraded for interval metering functionality
- Advanced Metering Infrastructure ("AMI," or Smart Meters) includes interval metering functionality

#### O&R AMI deployment planned for Rockland County

Crange & Rockland

conEdison



36

DRAFT AND IN ACCORDANCE WITH UTILITY

**IMPLEMENTATION PLANS AS OF 7/24/2017** 

### Con Edison Transition to AMI: 2017 - 2022



37



Crange & Rockland

#### Agenda

ConEdison Crange & Rockland

Торіс
Value of DER framework
Phase One NEM and Mass Market Customers
Value Stack components
Tranche structure
Timeline for implementation
Q&A on VDER framework and Value Stack
Break
Tranche status
Interconnection rules
Metering requirements
CDG Enrollment and Value Stack Billing
Developer Journey
Closing Q&A

DRAFT AND IN ACCORDANCE WITH UTILITY

**IMPLEMENTATION PLANS AS OF 7/24/2017** 

- Developer provides subscription allocation to the utility
- Form to include the following:
  - Host account contact information
  - Subscriber names, accounts, and distribution percentages
- Initial subscription must be submitted 60 days prior to the host account commencing service under CDG
- Form can be submitted to:

conEdison

- conEdison dl-cdgdevelopers@coned.com
- Carange & Rockland online through PowerClerk



- Host and subscribers are enrolled once the subscription letter is received
- Each account will be enrolled with the distribution allocation specified by the host
- Each subscriber account will have a dedicated account representative for the customer to contact



- Once enrolled in CDG, host and subscriber accounts will continue to receive the same invoice from the utility for energy consumed
- The value stack credit will now appear on the invoice as a line item
- CDG & RNM hosts will receive an additional statement with more details regarding the subscriber accounts and credits applied



- There is no cash out for value stack credits
- Subscriber credits roll over month-to-month until end of 25 year term
- Annual reconciliation for host credit; a two year grace period to distribute any credits the host retains at the end of the annual period
- Both host and subscribers will have the phone number for the dedicated utility account representative



#### Developer Data Access

- Access to an portal will be provided to developers where they can obtain data for subscribers
- A letter of authorization will be required from the subscribers in order for developers to get access to subscriber data
- Data provided for subscribers will include:
  - Energy consumption (2 years)
  - Bill amounts (2 years)
  - Interval Meter Data (15 minute intervals)



# Information provided by developer to Utility

Section I - Host Information							
CDC Host Account: Service Address:	Account Name: Mailing Address:						
Customer Contact: Email Address:	Phone:						

44





# Information provided by developer to Utility

	Section II - Me	ember Allocation Information	
	Con Edison Account Number (15 digits)	Con Edison Account Name	Distribution %
1 2 3 4 5 6 7 8 9 10			
	Name: Signature:	Title: Date:	ed com





#### Information provided to host

Acct No. & Name	Allocation %	SC	Value Stack Credit	Actual Billed Dollars	Actual Billed kWh	Monthly Bank Contribution	Bank Withdraw	Bank Balance
123	25%	1	\$75	\$50	120	\$25	\$0	\$30
456	35%	2	\$100	\$90	200	\$10	\$0	\$50
789	40%	9	\$125	\$400	600	\$0	\$275	\$200

HOST VALUE STACK STATEMENT							
Energy	\$40	SC 1 MTC	\$31.25				
Capacity	\$25	SC 2 MTC	\$38.75				
Environmental	\$30	DRV	\$55				
		LSRV	\$80				
		TOTAL	\$300				
		kWh-export	1,200				



#### Information provided to CDG subscriber

Your billing summary as of Jul 1	0, 2017
Your previous charges and payments Total charges from your last bill Payments through Jul 6, thank you	\$154.02
Remaining balance	None
Your new charges - details start on page 2 Billing period: Jun 07, 2017 to Jul 07, 2017	
Electricity charges - for 30 days	\$193.27
Gas charges - for 30 days Adjustments	\$89.54 -\$99.46
Total new charges	\$183.35
Total amount due	\$183.35

ConEdison

Orange & Rockland

DRAFT AND IN ACCORDANCE WITH UTILITY IMPLEMENTATION PLANS AS OF 7/24/2017

47

#### Agenda

	Торіс	
1:10 PM	Value of DER framework	
	Phase One NEM and Mass Market Customers	
	Value Stack components	
	Tranche structure	
	Timeline for implementation	
2:30 PM	Q&A on VDER framework and Value Stack	
3:00 PM	Break	
3:20 PM	Tranche status	
	Interconnection rules	
	Metering requirements	
3:30 PM	CDG Enrollment and Value Stack Billing	
3:50 PM	Developer Journey	
4:15 PM	Closing Q&A	



### Developer Journey: Pre-Application

Information	Where It Will Be
Day Ahead zonal LBMPs	www.NYISO.com
Generating Capacity Alt 1, 2 & 3	VDER Statement
Environmental Value	Department of Public Service
Location of LSRV zones, MW caps, and subscription status	DG website
DRV and LSRV values	VDER Statement
Tranche status & MTCs	DG Website, VDER Statement
VDER FAQs	NYSERDA, DPS, DG websites
SIR Application Requirements	DG website (exists today)



ConEdison



#### Developer Journey: Interconnection



Crange & Rockland

conEdison



 Final acceptance marks start of Phase One NEM and Value Stack terms, and generation of credits

ConEdison : transition from Energy Services to Customer Care Group

Crange & Rockland : transition from DG Group to Customer Service

- For Value Stack, only grid injections (export) are credited
- Value Stack rates could be unique for each project depending on location, generation profile, and, if CDG, subscription mix
- Value Stack rate components update frequently; check the VDER Statement









DRAFT AND IN ACCORDANCE WITH UTILITY **IMPLEMENTATION PLANS AS OF 7/24/2017** 

52