Development of an Interactive Valuation Model for Distributed Energy Resource Value

Cooperative Research and Development Final Report

CRADA Number: CRD-19-00788

NREL Technical Contact: Karlynn Cory

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Technical Report
NREL/TP-7A40-80995
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Cooperative Research and Development Final Report

Report Date: September 14, 2021

In accordance with requirements set forth in the terms of the CRADA agreement, this document is the final CRADA report, including a list of subject inventions, to be forwarded to the DOE Office of Scientific and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

Parties to the Agreement: Oklahoma Secretary of Commerce & Tourism

CRADA Number: CRD-19-00788

CRADA Title: Development of an Interactive Valuation Model for Distributed Energy Resource Value

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Sponsoring DOE Program Office(s):

Office of Energy Efficiency and Renewable Energy (EERE), Solar Energy Technologies Office

Joint Work Statement Funding Table showing DOE commitment:

No NREL shared resources

Estimated Costs	NREL Shared Resources a/k/a Government In-Kind
Year 1	\$0.00
TOTALS	\$0.00

Executive Summary of CRADA Work:

The Oklahoma Secretary of Commerce & Tourism (OSCT) seeks to address perceived challenges and barriers to the deployment of distributed energy generation resources (DERs), including solar and other technologies, in the state of Oklahoma. The Scope of Work (SOW) outlines follow-on tasks related to the previous CRADA # CRD-18-762. The first task will finalize the Interactive Valuation Model Requirements Document, the final draft of which was provided in June 2018. The second task includes the building, validation, and finalization of the interactive valuation model for expressing distributed energy resource value based on user inputs to be completed by June 30, 2019. Training for how to prepare the data inputs and use the model will also be provided.

To address perceived challenges and barriers to the deployment of distributed energy generation resources (DERs), including solar and other technologies, in the state of Oklahoma, the work under this CRADA will: 1) finalize the draft Interactive Valuation Model Requirements Document delivered in June 2018; 2) finish building and validating the interactive valuation model for expressing DER value based on user inputs, and 3) provide training for use of this model.

Summary of Research Results:

Task 1. Finalize Interactive Valuation Model Requirements Document

As communicated to NREL by Secretary Michael Teague, former Secretary of Energy and Environment, the motivation for developing an Interactive Net Valuation Model is to create a common calculation basis and methodology from which different Thought Group stakeholders can assess DER value based on their individual priorities. Adopting a common methodology and net valuation model lends transparency to the stakeholder-driven process of determining how to value DERs, particularly solar PV, across the state. The aim is for the model to be flexible enough to handle more detailed data in the long-term, such that as greater fidelity data are gathered, they can be used to refine the analysis in future years. Secretary Teague and the Thought Group acknowledged that DER valuation is dynamic and will need to be recalculated at least annually to capture changes in the market and electric system over time.

One of the primary goals in undertaking a DER valuation effort is to identify the full suite of costs and benefits that *could* be captured in energy markets, whether or not they currently are. In most cases, existing energy market terms were constructed in the absence of DER technologies and are thus inadequate at capturing the true costs and benefits of DERs to electric systems and utilities. DER valuation seeks to identify existing market values, as well as factors that are not currently captured in the market (often referred to as “externalities”) and to add them together to more accurately assess the value that DERs provide.

In developing this requirements document, NREL worked with OSEE and the Thought Group to present different calculation methods and resulting fidelity considerations for each input variable included in this analysis. All variables that are typically included in DER valuation analyses are considered here and will be included in the eventual Interactive Net Valuation Model. It will be up to the end-user to determine whether to select or ignore individual variables and associated values when using the model. In other words, NREL will present the full range of potential market terms and input variables but will not determine which of those variables Oklahoma stakeholders elect to include in their DER valuation calculation. NREL outlined options and approaches, but ultimately did not direct any of the decisions OSEE and the Thought Group made about data sources used, desired level of complexity, and resulting fidelity of the methodology. To foster informed decision-making, NREL subject matter experts did provide information and resources about what variables other jurisdictions are considering, and the tradeoffs between different approaches, including the challenges and costs associated with data collection at different levels of fidelity.

A final draft of the NREL Interactive Valuation Model Requirements Document was delivered to the State of Oklahoma on June 29, 2018; no comments were received on that document. NREL finalized the Interactive Valuation Model Requirements Document to include comments from the OSCT office as well as the Oklahoma Distributed Generation Thought Group (hereafter “Thought Group”) convened by the State of Oklahoma. The finalized Requirements Document includes the following:

- a) Purpose and Scope (Overview of the Interactive Valuation Model and what it will do)
- b) Functionality and Usability Requirements
- c) Methodology and Assumptions
- d) Data Requirements
- e) Remaining Questions and Constraints
- f) Next Steps.

NREL proposed to have a subject matter expert travel to Oklahoma to facilitate finalization of the Requirements Document in a timely manner; thus, one trip from Denver to Oklahoma (exact location TBD) is included in the budget estimate.

Results

- NREL subject matter expert traveled to Oklahoma to meet with the stakeholders, ask questions, and identify a path forward to facilitate finalization of the requirements document (see Figure 1)
- NREL team updated the Final Interactive Valuation Model Requirements Document to capture decisions from the trip to Oklahoma (see Figure 2)
- NREL created a presentation to facilitate stakeholder discussions and answer questions so that the
 - requirements document could be finalized
 - Deliverable: Final Interactive Valuation Model Requirements Document (see Table 1)
- NREL understood what was desired in the Interactive Valuation Model and could begin to build it.

Thank you DG Thought Group!!

- Oklahoma Office of the Secretary of Energy and Environment
- Oklahoma Corporation Commission (Public Utilities Division)
- Office of the Attorney General (OK)
- Oklahoma Solar Association
- Oklahoma Industrial Energy Consumers
- Developers (Grand River Dam Authority/GRDA)
- Law Firms (Phillips Murrah, Hall Estill)
- Oklahoma Sustainability Network (OSN)

- Utilities
 - Public Service Company of Oklahoma / American Electric Power (AEP)
 - Oklahoma Association of Electric Cooperatives (OAEC)
 - OGE Energy Corp. (Oklahoma Gas and Electric)
 - Oklahoma Municipal Power Authority (OMPA)
 - Western Farmers Electric Cooperative (WFEC)

Figure 1: List of Thought Group participants

OK DG Thought Group Determined:
Transmission Capacity Methodology-2
VOS – Transmission Capacity

DG Thought Group Choice

Name	Description	Tools Required
1. Congestion cost relief	Uses LMP differences to capture the value of relieving transmission constraints	Spreadsheet
2. Scenario-based modeling transmission impacts of DGPV	Simulates system operation with and without combinations of DGPV and planned transmission in a PCM	PCM
3. Co-optimization of transmission expansion and non-transmission alternative simulation	Uses a transmission expansion planning tool to co-optimize transmission and generation expansion and a dedicated power flow model to calculate LOLEs to validate proposed build-out plans	Dedicated power flow model or transmission-expansion planning model

Figure 2: Meeting slide reflecting Thought Group choice for the Interactive Valuation Model

Table 1. From Final Interactive Valuation Model Requirements document

Avoided Generation Capacity			
Avoided Generation Capacity Data Input	Data provided by:	Units	Number of data points
The First Year Capacity is Needed	User	Year	Single value, year Y
Capacity Credit Value	User	\$/kW	Single value
Generation Capacity Credit	User	%	8760 LOLP values
Capacity factor (CF) approximation using LOLP	User	%	X% of relevant peak hours
Effective Load Carrying Capability (ELCC)	User	%	Output of SERVIM model

Task 2. Build, Validate and Finalize Interactive Valuation Model

Under the first contract, NREL began to build the Interactive Valuation Model. Under this contract NREL completed construction, validated, and finalized the Interactive Valuation Model for expressing DER value based on user inputs. The model will be developed based on the final version of the Requirements Document, once it is complete.

The Interactive Net Valuation Model will take pre-processed data inputs from the user, run them through valuation calculations, determine the total value for each market term, and sum the total value across input variables. All market terms included will be estimated based on the value of energy produced, in dollars per megawatt-hour (MWh) generated. The goal is to identify the value of DERs that is provided to the utility and its electric system, even if those values are not captured in current market terms.

The user will be able to turn different terms on and off in the model. Thus, the Interactive Net Valuation Model will be designed to capture the full value of DERs for each term, within the constraints of the methodological approach selected that is turned on in the model. It is up to the individual user, and OSEE and the Thought Group more broadly, to determine which terms to include. NREL will include the terms typically included in these calculations in other jurisdictions. If the Thought Group has a disagreement about which terms to include, the Thought Group, as directed by the Secretary of Energy and Environment and OSEE staff, will resolve the dispute.

The model will capture the full value of each active term. In other words, to the extent that market prices capture a fraction of the total value, because it only represents one aspect (e.g., the cost of fuel for energy), additional terms will be added to the market prices to capture the full value that DER provides of avoiding all the costs.

The model will be developed in Microsoft Excel, a user-friendly and widely available platform to increase transparency. This Excel model is not expected to interact with any other software. The model file will not require a password to open, but formulas will be password-protected to help prevent users from accidentally writing over a cell with a formula in it.

Results

- Interactive Valuation Model was built
 - The draft model was provided to stakeholder groups for their review
- Interactive Valuation Model was validated
 - A webinar was held to train the stakeholders about the model (see task 3)
- Comments on how to improve the model were received at the training (see Figure 9)
- Interactive Valuation Model was finalized and delivered
 - For those comments that could be addressed and that were relevant to the Excel model or the inputs, they were addressed
 - A spreadsheet of solar data for 8 locations in Oklahoma was provided as well (see Figure 3)
- The Interactive Valuation Model was built, validated, and delivered (see Figures 4-6).

RAW SAM Data: Do not use - not normalized to 1MW still kW units	Gage Airport West Orientation 5 kW Residential Standard Fixed Roof 20° tilt 270° azimuth	Gage Airport West Orientation 100 kW Commercial Standard Fixed Roof 10° tilt 270° azimuth	Gage Airport West Orientation 500 kW Commercial Standard (Ground) Fixed Open Rack 35° tilt 270° azimuth	>>> COPY 3 COLUMNS>>> Columns G & H & I >>> Gage Airport West Orientation Production: Normalized to 1MW/ units changed kW to MW	Gage Airport West Orientation 1MW Residential Roof 1MW = (5kW*200) Standard Fixed Roof 20° tilt 270° azimuth power generated (MW) = kW/1000	Gage Airport West Orientation 1MW Commercial Roof 1MW = (100kW*10) Standard Fixed Roof 10° tilt 270° azimuth power generated (MW) = kW/1000	Gage Airport West Orientation 1MW Commercial Ground 1MW = (500kW*2) Standard Fixed Open Rack 35° tilt 270° azimuth power generated (MW) = kW/1000	RAW SAM Data: Do not use - not normalized to 1MW still kW units	Gage Airport Southwest Orientation 5 kW Residential Standard Fixed Roof 20° tilt 225° azimuth
SAM 2018.11.11_r3 PVWatts/D621720	power generated (kW)	power generated (kW)	power generated (kW)					SAM 2018.11.11_r3 PVWatts/D621720	power generated (kW)
Jan 1, 12:00 am	0	0	0		0	0	0	Jan 1, 12:00 am	0
Jan 1, 01:00 am	0	0	0		0	0	0	Jan 1, 01:00 am	0
Jan 1, 02:00 am	0	0	0		0	0	0	Jan 1, 02:00 am	0
Jan 1, 03:00 am	0	0	0		0	0	0	Jan 1, 03:00 am	0
Jan 1, 04:00 am	0	0	0		0	0	0	Jan 1, 04:00 am	0
Jan 1, 05:00 am	0	0	0		0	0	0	Jan 1, 05:00 am	0
Jan 1, 06:00 am	0	0	0		0	0	0	Jan 1, 06:00 am	0
Jan 1, 07:00 am	0	0	0		0	0	0	Jan 1, 07:00 am	0
Jan 1, 08:00 am	0.10775	2.21676	9.93837		0.02155	0.0221676	0.01987674	Jan 1, 08:00 am	0.10775
Jan 1, 09:00 am	0.169973	4.54299	18.2348		0.0339946	0.0454299	0.0364696	Jan 1, 09:00 am	0.4868
Jan 1, 10:00 am	0.399269	16.8562	19.9111		0.0798538	0.168562	0.0398222	Jan 1, 10:00 am	1.38983
Jan 1, 11:00 am	1.1379	30.3706	54.743		0.22758	0.303706	0.109486	Jan 1, 11:00 am	2.19564
Jan 1, 12:00 pm	1.76146	39.467	134.244		0.352292	0.39467	0.268488	Jan 1, 12:00 pm	2.72613
Jan 1, 01:00 pm	2.15074	43.6216	199.702		0.430148	0.436216	0.399404	Jan 1, 01:00 pm	2.98002
Jan 1, 02:00 pm	2.23989	41.9747	234.37		0.447978	0.419747	0.46874	Jan 1, 02:00 pm	2.90599
Jan 1, 03:00 pm	2.01673	34.673	233.427		0.403346	0.34673	0.466854	Jan 1, 03:00 pm	2.50052
Jan 1, 04:00 pm	1.46141	22.0511	190.242		0.292282	0.220511	0.380484	Jan 1, 04:00 pm	1.75156
Jan 1, 05:00 pm	0	0	0		0	0	0	Jan 1, 05:00 pm	0
Jan 1, 06:00 pm	0	0	0		0	0	0	Jan 1, 06:00 pm	0
Jan 1, 07:00 pm	0	0	0		0	0	0	Jan 1, 07:00 pm	0
Jan 1, 08:00 pm	0	0	0		0	0	0	Jan 1, 08:00 pm	0
Jan 1, 09:00 pm	0	0	0		0	0	0	Jan 1, 09:00 pm	0
Jan 1, 10:00 pm	0	0	0		0	0	0	Jan 1, 10:00 pm	0
Jan 1, 11:00 pm	0	0	0		0	0	0	Jan 1, 11:00 pm	0
Jan 2, 12:00 am	0	0	0		0	0	0	Jan 2, 12:00 am	0
Jan 2, 01:00 am	0	0	0		0	0	0	Jan 2, 01:00 am	0
Jan 2, 02:00 am	0	0	0		0	0	0	Jan 2, 02:00 am	0
Jan 2, 03:00 am	0	0	0		0	0	0	Jan 2, 03:00 am	0
Jan 2, 04:00 am	0	0	0		0	0	0	Jan 2, 04:00 am	0
Jan 2, 05:00 am	0	0	0		0	0	0	Jan 2, 05:00 am	0
Jan 2, 06:00 am	0	0	0		0	0	0	Jan 2, 06:00 am	0

Figure 3: Solar data from the System Advisor Model (SAM)

Oklahoma Distributed Solar Interactive Net Valuation Model

Instructions

Start with the <Input-DPV Shape> tab. This tab allows you to enter distributed photovoltaic (DPV) production data for 1 to 3 separate Areas within the Utility jurisdiction.

Enter the Utility Name in the **BLUE** input cell C9.

Determine the 1-3 Areas in the Utility that you want to analyze.

Enter the Names that you wish to use to identify these 1-3 Areas in the **BLUE** input cells E9, K9, and Q9.

NOTE: if you have only 1 Area to enter, you need to enter it as Area 1, if you have 2 Areas to enter, use Area 1 and Area 2.

Determine which of these 8 available weather/insolation areas most closely represents each of the 3 Areas.

Gage Airport

Lawton Municipal

McAlester Municipal Airport

Oklahoma City

Stillwater Regional

Texarkana, AR (to represent Broken Bow, OK)

Tulsa International Airport

Vance AFB

For each of the 1-3 areas chosen, choose an orientation (South, South-West, or West) for the PV modules. Note that the orientation chosen will impact the timing and magnitude of the solar resource.

Open the Excel DPV Production data workbook "Oklahoma SAM Data.xlsx". This separate workbook has DPV Production data for the 8 locations listed, for 3 different orientations (South, South-West, and West).

Copy the 3 entire columns indicated (Residential Roof, Commercial Roof, Commercial Ground Mount) for the location and orientation that most closely represents the weather and insolation for the area to be evaluated.

*** A different orientation may be chosen for each of the 3 areas, however, the 3 configurations (Residential, Commercial, Ground Mount) within each area must all have the same orientation.**

Paste these 3 columns in the **BLUE** input columns G,H, and I. If you have 2 or 3 Areas, also paste appropriate values into columns M,N,O and S,T,U. When you paste the columns of values, please use **Paste Special>Values**, instead of just copy/paste.

*** If you are entering custom DPV data, please enter 8760 values and scale it to represent 1 MW, the same way the data in the workbook has been scaled. Calculations used in the model assume 1 MW data.**

Second, go to the <Input-General> tab and enter the requested inputs in the **BLUE** input cells.

Year X is the year that you choose as the start year for your 25-year analysis.

The **Real** Discount Rate must be used instead of a Nominal Discount Rate, because inflation is not considered in the model. This is used in net present value calculations for Avoided Energy, Generation Capacity, Distribution Capacity and Program Administration costs.

If you have access to an ELCC (Effective Load-Carrying Capacity Approximation), please enter it.

*SPP SERV (Southwest Power Pool's Strategic Energy & Risk Valuation Model) has the capability to calculate ELCC (Effective Load-Carrying Capacity Approximation).

If you **don't** have access to an ELCC, you will need to enter Loss of Load Probability (LOLP) as 8760 values in column L, in order to calculate a Capacity Factor approximation to determine Avoided Generation Capacity Costs.

When you paste the values, please use Paste Special>Values, instead of just copy/paste.

If you don't have access to an ELCC, you will also need to enter the X% (of 8760) relevant or riskiest (i.e., highest) LOLP values that you would like to evaluate to find the corresponding DPV production. For example, X=10% would consider the 876 relevant hours.

Figure 4: Instructions from Interactive Valuation Model

Please enter the Utility Name on the tab <Inputs-DPV Production>			Oklahoma Distributed Solar Interactive Net Valuation Model							
Levelized Net Value of Distributed PV (\$/MWh)										
25 Year Levelized Value			Gross Value A (\$/MWh)	x	Load Match Factor** B (%)	x	Loss Savings Factor*** (1+C) (%)	=	Distributed PV Value D (\$/MWh)	
For each term below, please select: ON OFF										
Energy	ON	Avoided Energy Cost*	incomplete inputs				incomplete inputs		incomplete inputs	
Generation Capacity	ON	Avoided Capital Investment / Fixed O&M	incomplete inputs		incomplete inputs		incomplete inputs		incomplete inputs	
Transmission and Distribution Capacity	ON	Avoided Transmission Capacity	incomplete inputs		incomplete inputs		incomplete inputs		incomplete inputs	
	ON	Avoided Distribution Capacity	incomplete inputs		incomplete inputs		incomplete inputs		incomplete inputs	
Environmental	ON	Avoided Market NO _x Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Societal NO _x Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Market SO ₂ Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Societal SO ₂ Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Market CO ₂ Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Societal CO ₂ Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Market Hg Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Societal Hg Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Market Ozone Cost	incomplete inputs				incomplete inputs		incomplete inputs	
	ON	Avoided Societal Ozone Cost	incomplete inputs				incomplete inputs		incomplete inputs	
Solar Integration Costs	ON		incomplete inputs				incomplete inputs		incomplete inputs	
Program Administration Costs	ON		incomplete inputs				incomplete inputs		incomplete inputs	
Value of Voltage Regulation	OFF	Placeholder for future voltage control standards	N/A				incomplete inputs		N/A	
25 Year Levelized Net Value of Distributed PV \$/MWh									\$0.00	Partial Total
<p>*The Avoided Energy Cost term includes only variable O&M and variable emissions costs to the extent they are included in Southwest Power Pool (SPP) energy costs</p> <p>**The Load Match Factor is the ELCC, if it is provided. If the ELCC is not available, the Load Match Factor for the Generation Capacity is the calculated Capacity Credit, and for the Transmission and Distribution Capacity, it is a weighted capacity factor.</p> <p>***Distribution losses, and Transmission plus Distribution losses, are found in Column I of the table as the "Loss Savings Factor" term.</p>										
Inputs										
Calculated or Previous Input										

Figure 5: Results from Interactive Valuation Model

Avoided Energy Cost Calculation										
Please enter Utility Name on <Inputs-DPV Shape> tab										
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	
Area 1	Enter NAME in <Input-DPV Shape>	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete
	Projected cumulative MW DPV in Area 1	MW	-	-	-	-	-	-	-	-
	Cumulative MW Residential in Area 1	MW	-	-	-	-	-	-	-	-
	Cumulative MW Commercial roof top in Area 1	MW	-	-	-	-	-	-	-	-
	Cumulative MW Commercial ground mount in Area 1	MW	-	-	-	-	-	-	-	-
	Value of DPV Energy in given Year in Area 1	\$	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Sum of hourly weighted DPV Energy in given year in Area 1	MWh	-	-	-	-	-	-	-	-
	\$/MWh weighted DPV Energy in given year in Area 1	\$/MWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Levelized DPV Energy Value over 25 years in Area 1	\$/MWh	incomplete inputs							
Area 2	(optional entry in <Input-DPV Shape>)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	
		incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete
	Cumulative projected MW DPV in Area 2	MW	-	-	-	-	-	-	-	-
	Cumulative MW Residential in Area 2	MW	-	-	-	-	-	-	-	-
	Cumulative MW Commercial roof top in Area 2	MW	-	-	-	-	-	-	-	-
	Cumulative MW Commercial ground mount in Area 2	MW	-	-	-	-	-	-	-	-
	Value of DPV Energy in given Year in Area 2	\$	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Sum of hourly weighted DPV Energy in given year in Area 2	MWh	-	-	-	-	-	-	-	-
	\$/MWh weighted DPV Energy in given year in Area 2	\$/MWh	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Levelized DPV Energy over 25 years in Area 2	\$/MWh	incomplete inputs							

Figure 6: Avoided Energy Cost Calculation from Interactive Valuation Model

Task 3. Interactive Valuation Model Training

NREL will provide two webinar-based trainings to end users of the Interactive Valuation Model; the webinars will focus on model functionality and how the user can prepare the data to be entered into the model for a particular jurisdiction.

Results

- Two webinars were held to train end users and stakeholders on the Interactive Valuation Model: May 29, 2019 and June 5, 2019
- The webinars were used to validate the model and help stakeholders understand how to use the model, how to add inputs, and what the results mean (see Figure 7-8)
 - Based on the stakeholder input from the trainings, new data sets were created and delivered
 - Critical updates were identified for the model based on the stakeholder input from the trainings (see Figure 9)
 - The model was validated and improved thanks to the comments received during the training.

Agenda	
1	Background
2	Methodology
3	Inputs (in model)
4	List of Inputs (by term)
5	Model Demonstration

Figure 7: Agenda slide from Interactive Valuation Model training

<Input-DPV Shape> tab

1. Enter the utility name (C8)

2. Add up to 3 names of DPV production areas (E9, K9, and Q9)

a) NOTE: if you have only 1 Area to enter, you need to enter it as Area 1, If you have 2 Areas to enter, use Area 1 and Area 2.

b) Determine which three available weather/insolation areas represents each of the 3 areas of analysis; chose a single PV direction for each (S, SW, W); only one PV direction can be chosen for each area

c) Open Oklahoma SAM Data.xlsx. For the 3 different locations, copy 3 entire columns (Res. Roof, Com., Com. Ground Mount) for the location (out of 8) and orientation for each area.

d) If you use your own DPV data, please scale it to 1 MW for all configurations

Use Home > Paste > Paste Values into the model (not just Paste)

NREL | 24

Figure 8: Input slide from Interactive Valuation Model Training

Additional Comments? Questions?

• NREL is required to finish by OK FY year end (June 28, 2019)

• Thus, we need edits for the Model and Tech Spec, no later than Friday June 14th, 2019 in order to incorporate edits, changes, or suggestions.

• NREL is taking notes during this training and we will prioritize all suggested edits and address them in priority order. Any additional edits will be added in priority order to the list.

• There may be smaller edits or major edits we may not be able to accomplish. We will provide a list of edits addressed and edits not addressed.

Figure 9: Slide requesting feedback from Interactive Valuation Model Training

9

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Summary Conclusion

Over the course of this CRADA with the state of Oklahoma, three main accomplishments were successfully achieved:

- 1) The technical specifications in the document **Interactive Valuation Model Requirements Document** were finalized;
- 2) The **Interactive Valuation Model** was built, validated, and finalized for use by OK stakeholders; and
- 3) Two webinar trainings were held to educate the OK stakeholders on the **Interactive Valuation Model**.

Oklahoma stakeholders were expecting to populate the model and use it to identify what the value of solar is in the state. Their goal is to understand how the value of solar compares to existing tariffs and to decide if new incentives are needed to encourage more solar in the state.

Subject Inventions Listing:

None

ROI #:

None