

2017

STATUS REPORT ON  
**DISTRIBUTED ENERGY RESOURCE AND  
NET ENERGY METERING IMPLEMENTATION**



# **Status Report on Distributed Energy Resource and Net Energy Metering Implementation**

Pursuant to Section 58-39-140, South Carolina Code of Laws

**July 2017**

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# Introduction

On June 2, 2014, the Distributed Energy Resource (DER) Program Act (Act 236 or the Act) was signed into law by then Governor Nikki Haley. Act 236 was the result of consensus among a diverse group of stakeholders and created a pathway for growth in the renewable energy industry in South Carolina. The goal of Act 236 as stated in S.C. Code Ann. § 58-39-110 is to “promote the establishment of a reliable, efficient, and diversified portfolio of distributed energy resources” for South Carolina.

S.C. Code Ann. § 58-39-140(E) requires the South Carolina Office of Regulatory Staff (ORS) to prepare and submit a report on the status of implementation of the DER Program (Chapter 39) and Net Energy Metering (NEM or Net Metering) (Chapter 40). The purpose of this report is to meet the following requirement:

No later than July 31, 2016, the Office of Regulatory Staff shall prepare and submit to the General Assembly with copies to all members of the State Regulation of Public Utilities Review Committee a report on the implementation of this chapter and Chapter 40 of this title. The Office of Regulatory Staff shall update this report no later than July 31, 2017, and each two years thereafter. Upon receipt and review of these reports, and in consultation with the General Assembly, the Public Utilities Review Committee shall make recommendations to the Office of Regulatory Staff as to any changes in implementation that may be needed.

This update to the Report on Distributed Energy Resource and Net Energy Metering Implementation (Report) summarizes the status of implementation of the DER Programs and NEM for South Carolina’s three largest investor-owned utilities (Utilities or IOUs)—South Carolina Electric & Gas Company (SCE&G), Duke Energy Carolinas, LLC (DEC), and Duke Energy Progress, LLC (DEP).

# Act 236 Implementation

The purposes of Act 236 as summarized in the preamble, are to, among other things:

- Provide for a net energy metering program and its requirements, including costs and the responsibilities of the Public Service Commission of South Carolina (PSC or Commission) and the ORS; and
- Provide for a distributed energy resource program, set goals for the program, and provide for the process and implementation of the program, including the application and approval process for the program and cost recovery.

This Report provides a current status update of the following areas:

1. Value of distributed energy resources;
2. NEM capacity;
3. DER programs; and
4. DER program costs.

See Attachment A for a timeline of events relating to the implementation of Act 236.

## Value of Distributed Energy Resources

Pursuant to Act 236, the Commission established Docket No. 2014-246-E to conduct a generic proceeding for the purposes of implementing the requirements of Chapter 40, Net Energy Metering, specifically to establish the methodology to set any necessary charges and credits to ensure that the electrical utility recovers its cost of providing electrical service to customer-generators and customers who are not customer-generators (Methodology).<sup>1</sup>

### Net Energy Metering Methodology

- +/- Avoided Energy
- +/- Energy Losses/Line Losses
- +/- Avoided Capacity
- +/- Ancillary Services
- +/- Transmission and Distribution (T&D) Capacity
- +/- Avoided Criteria Pollutants
- +/- Avoided CO<sub>2</sub> Emission Cost
- +/- Fuel Hedge
- +/- Utility Integration & Interconnection Costs
- +/- Utility Administration Costs
- +/- Environmental Costs

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### = Total Value of NEM Distributed Energy Resource

On March 20, 2015, the Commission approved the Settlement Agreement in Order No. 2015-194, which included:

- The Methodology to be used to compute the value of DER generation;
- The 1:1 NEM Rate<sup>2</sup> shall be preserved until January 1, 2021; and
- The difference between the value of DER generation, as computed using the NEM Methodology, and the 1:1 NEM Rate shall be treated as a DER program expense and collected through the fuel clause. This difference shall not be recovered through base rates.

### Current Value of Distributed Generation

The Methodology values are updated annually during each Utility's annual fuel adjustment proceeding, and are submitted for approval to the Commission. See Figure 1 for the current Value of Distributed Generation (DG) calculated by the IOUs as of June 30, 2017. See Figure 2 for the historic values of DG.

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<sup>1</sup> Section 58-40-20(F)

<sup>2</sup> Commonly referred to as Net Metering 2.0

**FIGURE 1: VALUE OF DISTRIBUTED GENERATION AS OF JUNE 30, 2017 (CENTS/KWH)**

	<b>SCE&amp;G<sup>3</sup></b>	<b>DEC<sup>4</sup></b>		<b>DEP<sup>5</sup></b>	
<b>Components</b>	All	Small PV	Large PV	Small PV	Large PV
<b>Avoided Energy</b>	3.199	3.662	3.661	3.613	3.614
<b>Energy Losses/ Line Losses</b>	.276	.219	.218	.070	.070
<b>Avoided Capacity</b>	.172	1.129	1.125	1.328	1.331
<b>Ancillary Services</b>	0	0	0	0	0
<b>T&amp;D Capacity</b>	0	0	0	0	0
<b>Avoided Criteria Pollutants</b>	.004	0	0	.002	.002
<b>Avoided CO<sub>2</sub> Emission Cost</b>	0	0	0	0	0
<b>Fuel Hedge</b>	0	0	0	0	0
<b>Utility Integration &amp; Interconnection Costs</b>	0	0	0	0	0
<b>Utility Administration Costs</b>	0	0	0	0	0
<b>Environmental Costs</b>	0	0	0	0	0
<b>Total Value of DG</b>	<b>3.651</b>	<b>5.010</b>	<b>5.004</b>	<b>5.013</b>	<b>5.017</b>

**FIGURE 2: HISTORIC DISTRIBUTED GENERATION VALUES (CENTS/KWH)**

	<b>SCE&amp;G<sup>6</sup></b>	<b>DEC<sup>7</sup></b>		<b>DEP<sup>8</sup></b>	
<b>Total Values by Year</b>	All	Small PV	Large PV	Small PV	Large PV
<b>2015</b>	5.409	5.595	5.594	5.097	5.095
<b>2016</b>	4.126	5.010	5.004	4.829	4.836
<b>2017<sup>9</sup></b>	3.651			5.013	5.017

<sup>3</sup> Docket No. 2017-2-E, Order No. 2017-246<sup>4</sup> Docket No. 2016-3-E, Order No. 2016-687<sup>5</sup> Docket No. 2017-1-E, Order No. 2017-405<sup>6</sup> Docket Nos. 2015-205-E, 2016-2-E, 2017-2-E<sup>7</sup> Docket Nos. 2015-203-E, 2016-3-E<sup>8</sup> Docket Nos. 2015-204-E, 2016-1-E, 2017-1-E<sup>9</sup> The DG values for DEC have not yet been updated for 2017.

## Status of Net Energy Metering Capacity

Act 236 requires the IOUs to make NEM available to customer-generators on a first-come first-served basis until the total nameplate generating capacity of net energy metering systems equals two percent of the previous five-year average of the electrical utility's South Carolina retail peak demand.<sup>10</sup>

Commission Order No. 2015-194 requires the IOUs to file reports with the Commission as NEM participation levels are reached to identify and illustrate the costs unrecovered, if any, arising from customer adoption of net metered DER generation through December 31, 2020. The reports are to be filed when NEM capacity reaches the following thresholds of the Utility's previous five-year average South Carolina retail peak demand: (1) 0.5%; (2) 1.0%; (3) 1.5%; and (4) 2.0%.

SCE&G and DEC have reached the first NEM threshold. SCE&G reported on February 14, 2017, that NEM capacity reached 0.57% as of December 31, 2016. DEC reported on May 23, 2017, that NEM capacity reached 0.71% as of April 30, 2017.

See Figure 3 for the NEM requirements and current capacity by IOU as of May 31, 2017.

**FIGURE 3: NEM REQUIREMENTS AND CURRENT CAPACITY BY IOU AS OF MAY 31, 2017**

	SCE&G		DEC		DEP	
<b>Total Requirement</b>	84.5 MW		80 MW		26 MW	
<b>Total Remaining</b>	41.38 MW		19.6 MW		14.9 MW	
	Residential	Non-Residential	Residential	Non-Residential	Residential	Non-Residential
<b>Installed</b>	31.84 MW	3.51 MW	21.5 MW	10 MW	1.6 MW	1.5 MW
<b>Reserved</b>	7.34 MW	0.43 MW	4.3 MW	24.6 MW	1.8 MW	6.2 MW

<sup>10</sup> Section 58-40-20(B)

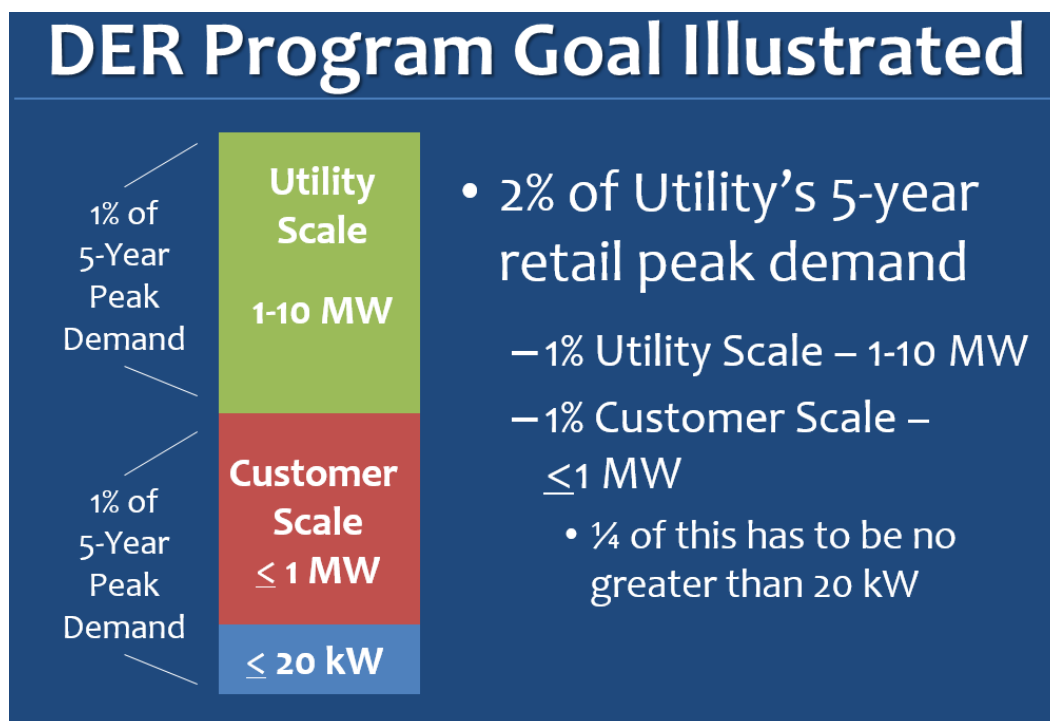


## Status of DER Programs

The Act requires that any DER Program shall, at a minimum, result in the development by January 1, 2021, of renewable energy facilities located in South Carolina with a cumulative installed nameplate capacity equal to at least 2% of the previous five-year average of the utility's South Carolina retail peak demand.<sup>11</sup> One half of the 2% shall be met by facilities sized between 1 and 10 megawatts (MW) (Utility Scale). The remaining half of the 2% shall be met by facilities sized less than 1 MW (Customer Scale) with a quarter of this 1% nameplate capacity being from facilities sized no greater than 20 kilowatts (kW) (Small Scale).

See Figure 4 for an illustration of DER Program goals as outlined in Act 236.

**FIGURE 4: ILLUSTRATION OF DER PROGRAM GOALS**



The Act also provides an option to the utility after the 2% goal is met, to allow utility investment in facilities greater than 1 MW and less than or equal to 10 MW with a cumulative installed nameplate capacity equal to at least 1% of the previous five-year average of the electrical utility's South Carolina peak demand.

<sup>11</sup> Section 58-39-130

Each of the IOUs' DER applications included detailed plans to develop renewable energy facilities, incent participation in the purchase or lease of renewable energy facilities and allow the IOUs to recover DER Program costs. All three DER Program applications recommended solar generation as the best method to reach Act 236 DER goals.

### ***South Carolina Electric and Gas Company***

SCE&G received Commission approval on July 15, 2015, in Order No. 2015-512 to implement its DER Programs. The programs offered by SCE&G to meet its DER goals include: (1) Contracts with solar developers for Utility-scale solar farms on company property under power purchase agreements (PPAs); (2) Contracts with solar developers for the installation of at least 30 MW of solar farms on property not owned by the utility under 15 or 20-year PPAs and where the solar power can be integrated into SCE&G's electrical grid; (3) a Performance Based Incentive (PBI) bill credit for residential customers fixed for a 10-year term; (4) Bill Credit Agreements (BCA) for non-residential customers fixed for 10-year terms; (5) a Community Solar program; and (6) the formation of a DER Program Advisory Group.

### ***Duke Energy Carolinas, LLC and Duke Energy Progress, LLC***

DEC and DEP also received Commission approval on July 15, 2015, in Order Nos. 2015-515 and 2015-514 respectively, to structure the DER Programs for both IOUs in a similar fashion. Both DEC and DEP DER Programs include: (1) the use of requests for proposals for large-scale renewable generation facilities; (2) up-front solar rebates (Solar Rebate Program) for residential and non-residential customers; (3) the formation of a DER Program Collaborative Group; and (4) the offering of a Shared Solar Program. DEC and DEP will solicit offers for 15-year PPAs and turnkey proposals with engineering, procurement, and construction agreements to meet Utility Scale goals.

## DER Program Results by IOU

Figure 5 displays each IOU's capacity goals and actual results achieved for Utility Scale and Customer Scale DER Programs.

**FIGURE 5: STATUS OF DER PROGRAM GOALS BY IOU AS OF MAY 31, 2017**

	SCE&G <sup>12</sup>		DEC <sup>13</sup>		DEP <sup>14</sup>	
<b>Total Goal</b>	84.5 MW		80 MW		26 MW	
<b>Total Remaining</b>	22.49 MW		58.18 MW		16.03 MW	
	Utility Scale	Customer Scale	Utility Scale	Customer Scale	Utility Scale	Customer Scale
<b>Goal</b>	42.25 MW	42.25 MW	40 MW	40 MW	13 MW	13 MW
<b>Remaining</b>	21.55 MW	0.94 MW	40 MW	18.18 MW	13 MW	9.97 MW
<b>Actual Installed</b>	20.70 MW	41.31 MW	0 MW	21.82 MW	0 MW	3.03 MW
<b>Reserved Capacity</b>	27.46 MW	25.98 MW	0 MW	17.01 MW	0 MW	9.04 MW

Figure 6 through Figure 9 provide updates on each of the IOUs DER Programs.

**FIGURE 6: UPDATE ON UTILITY SCALE DER PROGRAMS AS OF MAY 31, 2017**

	SCE&G	DEC	DEP
<b>Status of RFP</b>	70 responses	32 responses	23 responses
<b>Contracts</b>	9 PPAs Executed; 48.16 MW	No contracts executed	1 PPA Executed; 5 MW
<b>Capacity</b>	20.70 MW Installed	0 MW Installed	0 MW Installed

<sup>12</sup> Docket No. 2015-54-E, Order No. 2015-512

<sup>13</sup> Docket No. 2015-55-E, Order No. 2015-515

<sup>14</sup> Docket No. 2015-53-E, Order No. 2015-514

**FIGURE 7: UPDATE ON SMALL SCALE CUSTOMER DER PROGRAMS AS OF MAY 31, 2017**

	<b>SCE&amp;G</b>	<b>DEC</b>	<b>DEP</b>
<b>Small Scale Programs (&lt; 20 kW)</b>	PBI	Solar Rebate	Solar Rebate
<b>Systems Installed</b>	1,088	1,540	113
<b>Capacity</b>	8,077 kW	12,895 kW	1,174 kW
<b>Incentives Paid<sup>15</sup></b>	\$349,814	\$14,523,226	\$1,280,468
<b>Reservations</b>	No systems reserved	54 Customers approved 515 kW Reserved	373 Customers approved 1,803 kW Reserved

**FIGURE 8: UPDATE ON LARGE SCALE CUSTOMER DER PROGRAMS AS OF MAY 31, 2017**

	<b>SCE&amp;G</b>	<b>DEC</b>	<b>DEP</b>
<b>Large Scale Programs (&gt; 20 kW, &lt; 1MW)</b>	BCA	Solar Rebate	Solar Rebate
<b>Systems Installed</b>	60	59	4
<b>Capacity</b>	7,087 kW	8,933 kW	1,863 kW
<b>Incentives Paid<sup>15</sup></b>	\$585,477	\$11,821,330	\$2,365,380
<b>Reservations</b>	76 Systems 18,211 kW	56 Customers 16,451 kW	15 Customers 6,993 kW

<sup>15</sup> SCE&G remits incentives based on actual generation on a monthly basis. Duke Energy Carolinas and Duke Energy Progress remit a lump sum at the time a system is energized.

**FIGURE 9: UPDATE ON COMMUNITY/SHARED SOLAR DER PROGRAMS AS OF MAY 31, 2017**

	<b>SCE&amp;G</b>	<b>DEC</b>	<b>DEP</b>
<b>Community/Shared Solar Programs</b>	Purchase and Subscription Models Low Income Subscription Model	Subscription Model Low Income Subscription Model	Subscription Model Low Income Subscription Model
<b>Development</b>	Contract signed	RFP responses and Final Bids under review	RFP responses and Final Bids under review
<b>Launch Date</b>	Purchase and Subscription Models launched in May 2017 Low Income scheduled to launch in September 2017	Scheduled for 4 <sup>th</sup> Quarter 2017	Scheduled for 4 <sup>th</sup> Quarter 2017
<b>Reservations</b>	550 Pre-registered residential customers 15 Non-Residential Customer Reservations 1 Non-Residential Contract Agreement	No reservations	No reservations

## Update on DER Program Costs

Act 236 allows IOUs to recover costs related to their DER Programs to the extent that costs are reasonably and prudently incurred to implement approved programs. DER Program costs are recovered during each Utility's annual fuel proceeding. Each of the costs, including NEM incentives, are separately identified by the IOU, reviewed by the ORS, and submitted for approval to the Commission. The value of each cost component can vary due to a number of factors: fuel costs, capacity costs, generation mix, location of its DER generation, billing procedures, and current retail rates.

### *DER Program Cost Categories*

The DER Program costs are categorized as either incremental or avoided costs and are allocated and recovered from customers under a separate distributed energy component of the overall fuel factor, based on the same method used for variable environmental costs.<sup>16</sup> Avoided costs, which are payments for purchases of electricity, are calculated using the lesser of rates negotiated pursuant to the Public Utility Regulatory Policies Act of 1978 (PURPA) or an electrical utility's most recently approved or established avoided costs rates in South Carolina.<sup>17</sup> Avoided costs include amounts paid for purchases of power from participants in solar rebate programs, shared/community solar programs, net metering, and bill credit agreements at the utility's avoided cost rates. Utilities may also incur avoided costs stemming from their own generation constructed to implement a DER Program and/or from new programs introduced in the future to implement a DER Program.

Incremental costs are costs incurred by the electrical utility to implement a DER Program. Incremental costs include, but are not limited to, costs in excess of the avoided costs or negotiated rates pursuant to PURPA, the full cost of a utility's investment in non-generating distributed energy resources, the utility's weighted average cost of capital as applied to the electrical utility's investment in distributed energy resources, generally accepted expenses associated with a project, and incremental labor associated with implementing a distributed energy resource program.<sup>18</sup>

See Figure 10 for a total of avoided and incremental DER Program costs by IOU as of May 31, 2017.

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<sup>16</sup> Section 58-27-865 (A)(1)

<sup>17</sup> Section 58-39-120 (B)

<sup>18</sup> Section 58-39-140

**FIGURE 10: TOTAL DER PROGRAM COSTS AS OF MAY 31, 2017**

Utility	Incremental Costs	Avoided Costs
SCE&G	\$6,700,135	\$531,945
DEC	\$4,879,401	\$28,386
DEP	\$2,120,287	\$2,673

### ***Cost Recovery Mechanisms***

Avoided costs are recovered by customer class in the same manner as fuel, variable environmental, and avoided capacity costs. A per kilowatt hour (kWh) charge is calculated using the over/under recovered avoided costs for a utility's actual review period, estimated period, and forecasted period divided by the projected kWh sales for the next twelve-month billing period.

Incremental costs are recovered by customer class in a different manner than avoided costs. Incremental costs are collected as a separate fixed dollar amount per account whereas avoided costs are billed per kWh in the customer's usage charge. S.C. Code Ann. § 58-39-150 requires the incremental costs to be capped for the protection of consumers and to ensure that the cost of DER Programs do not exceed a reasonable threshold. The following incremental cost caps apply to an IOU's DER Program:

- Residential customers           \$12 per year
- Commercial customers        \$120 per year
- Industrial customers           \$1,200 per year

See Figure 11 for the current annual DER Program incremental per-account charges by IOU as of June 30, 2017.

**FIGURE 11: ANNUAL DER PROGRAM INCREMENTAL CHARGES BY IOU AS OF JUNE 30, 2017**

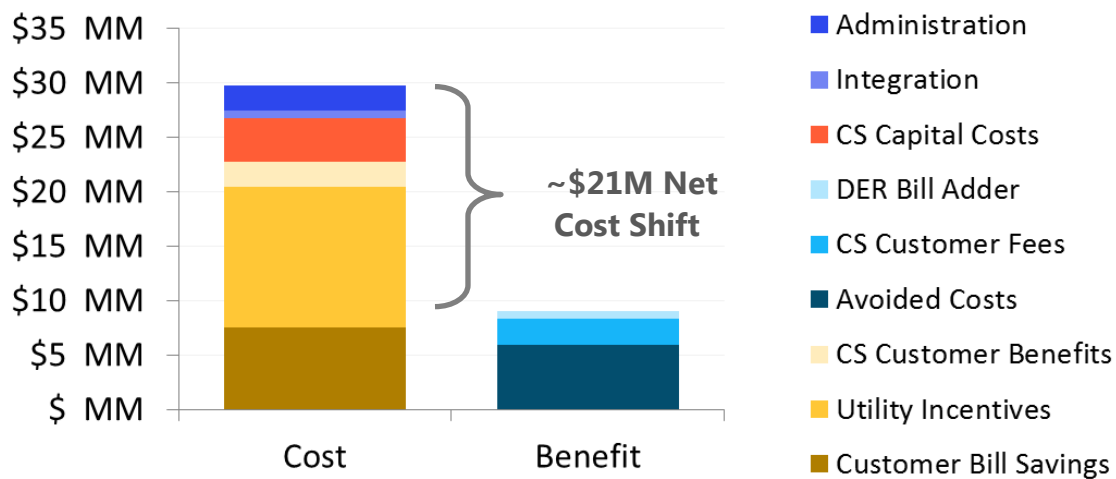
Utility	Residential	Commercial	Industrial
SCE&G	\$10.92	\$39.48	\$1,200.00
DEC	\$8.14	\$22.07	\$964.86
DEP	\$12.00	\$34.76	\$1,200.00

## Cost Impact Evaluation

The ORS enlisted the assistance of Energy and Environmental Economics, Inc. (E3) in updating the actual and forecasted cost and benefit data published in the 2015 South Carolina Act 236 Cost Shift and Cost of Service Analysis.<sup>19</sup> Although customer adoption has increased, the forecasted cost shift estimates prepared by E3 have remained relatively stable. The *de minimus* changes include a decrease in avoided costs and a slight increase in administrative costs. See Figure 12 for the updated estimated cost shift forecasted in year 2020.

The ORS recommends an update of the cost shift data in conjunction with the ongoing Act 236 stakeholder work as coordinated through the State Energy Plan.

**FIGURE 12: FORECASTED ANNUAL COST SHIFT IN 2020, UPDATED AS OF MAY 31, 2017**



<sup>19</sup> Docket No. 2014-246-E



# Conclusion

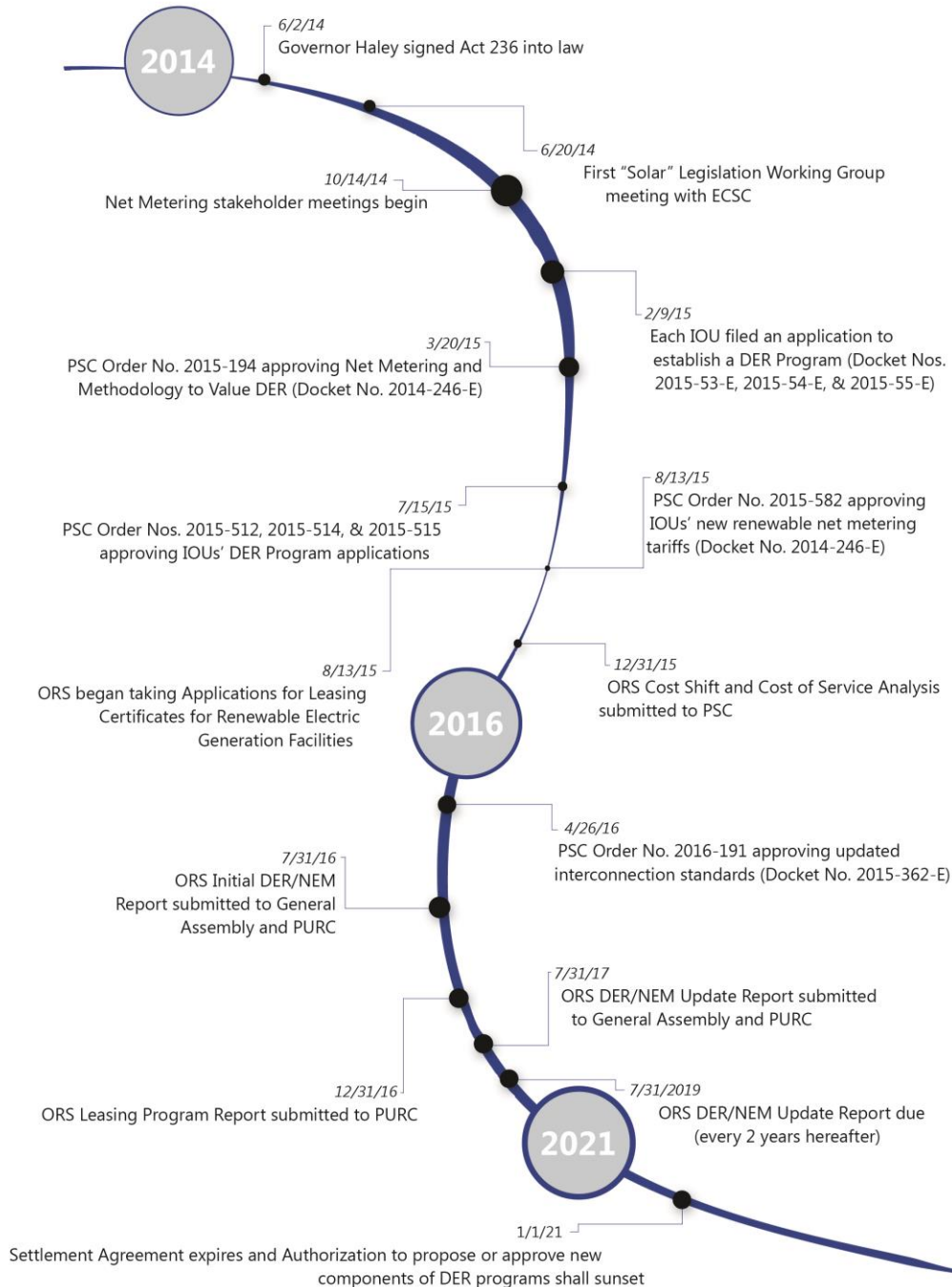
Since Act 236 was signed into law, significant progress has been made towards reaching the DER Program goals, NEM capacity requirements and promoting distributed energy resources in South Carolina. As of this report, the IOUs have collectively interconnected 86.9 MW of distributed generation, which amounts to over half of the 190.5 MW goal established by Act 236. In addition, more than 75 MW of capacity is currently reserved for development.

The spirit of collaboration fostered by Act 236 continues. The various stakeholders participate in the IOUs' collaborative groups and regularly provide feedback on challenges and successes. As work begins on implementing the State Energy Plan, the stakeholders will continue their collaborative efforts to evaluate the future of distributed energy resources for South Carolina.

The next report on the implementation of DER programs and NEM is due on July 31, 2019, and will provide more data on program results.

# Attachments

## Attachment A: Timeline for SC Distributed Energy Resource and Net Energy Metering Development



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