

Pennsylvania's Solar Future Plan
(0120-RE-DEP4991)

COMMENT AND RESPONSE DOCUMENT

November 17, 2018

INTRODUCTION

In assembling this document, the Pennsylvania Department of Environmental Protection (Department or DEP) has responded to all comments related to the Pennsylvania Solar Future Plan (Plan), Document Number 0120-RE-DEP4991. This Comment and Response document only contains comments and responses on the document noticed for public comment in the *Pennsylvania Bulletin* on July 7, 2018. *See* 48 Pa.B. 4017. All other comments are outside the scope of this Comment and Response document.

During the 45-day public comment period, the Department received comments on the Plan from 138 commentators, including individuals, corporations and organizations. The following table lists these commentators. The Commentator ID number is found in parenthesis following the comments in the Comment and Response document. For the purposes of this document, comments of similar subject have been grouped together and responded to accordingly.

TABLE OF COMMENTATORS

Commentator ID #	Name	Address
1	David Falvo	15 Yellow Brick Rd. PO Box 243 Honesdale, PA 18431
2	Sharon Furlong Bucks Environmental Action	133 E. Bristol Road Feasterville, PA 19053
3	Ms. Eileen Reed	1 Ebony Ct. Newtown, PA 18940-9251
4	Jeff Fetrow	6115 Charing Cross Mechanicsburg, PA 17050
5	Darrell Hooper	35 Peach Lane Ronks, PA 17572
6	Shannon Hurn Lewis and Clark Law School	645 Foxglove St., SE Salem, OR 97306
7	Chris Von Drach	552 Hill Church Road Boyertown, PA 19512
8	Richard Tolin	705 Cedar Lane Villanova, PA 19085
9	Anthony Durban	136 Sandy Drive Clinton, PA 15026
10	Wayne Mackey N/A	1500 Northfield Drive Apartment # 2210 Chambersburg, PA 17201
11	Robert Adonizio	2356 Cherry Hill Rd. Clarks Summit, PA 18411
12	Chris Driscoll Revival on Lincoln	366 Lincoln Ave. Pittsburgh, PA 15202
13	Seth Rose Eneref Institute	475 North St. Doylestown, PA 18901
14	Hugh Pepper	1101 Briar Way Perkasie, PA 18944
15	Bryan Wehler ARM Group Inc.	504 David Drive Mechanicsburg, PA 17050
16	Tim Mills ARM Group Inc.	1129 West Governor Road PO Box 797 Hershey, PA 17033
17	Marc DeNinno	610 12th Avenue Scranton, PA 18504
18	Ted & Ellen Stouch	36 Etter Road Newburg, PA 17240
19	Paul Bunnell	266 Tryon Street Honesdale, PA 18431
20	Melissa Cohen	1400 NW Marshall St. Portland, OR 97209

Commentator ID #	Name	Address
21	Elizabeth Girdan	21480 SE Foster Rd. Damascus, OR 97089
22	Aaron Steely Open Road Renewables	6606 Dalzell Street, Unit 2 Pittsburgh, PA 15217
23	Joe Bonaparte	252 East Knight Avenue Collingswood, NJ 08108
24	David Wheeler-Goodwin	180 Regal View Carlisle, PA 17013
25	Stephen Maier	733 North 17th Street Philadelphia, PA 19130
26	Mark Merdinger	2947 Fairfield Drive Allentown, PA 18103
27	Nancy Weston	2615 Union Ct. Bethlehem, PA 18017
28	Aaron Miller ARM Group Inc. and Penn State Student	1129 W. Governor Rd. Hershey, PA 17033
29	Joan L Farb Union for Concerned Scientists	211 Sequoia Drive Newtown, PA 18940
30	Jeffrey Steely Citizen	751 Airport Road Palmyra, PA 17078
31	Alexandra Olson	6606 Dalzell Place Pittsburgh, PA 15217
32	Mr. Randall Baird	1273 Highland St. Ext. DuBois, PA 15801
33	Amy Cornelius GreenBeams	623 S. 9th St. Philadelphia, PA 19147
34	Sharon Furlong Bucks Environmental Action, Bucks County Sierra	133 E. Bristol Road Feasterville, PA 19053
35	Colin G.	1308 S. Charles Street Baltimore, MD 21230
36	Amy Subbiah	1646 Copper Beech Circle Huntingdon Valley, PA 19006
37	Thomas J Brinker	801 Parkway Blvd. York, PA 17404
38	Richard Cleary	132 N. Sheridan Rd. Newmanstown, PA 17073
39	Mary Ann Evans	3373 Ritner Highway Newville, PA 17241
40	Gene Lane	901 Frost Hollow Road Easton, PA 18040
41	Thomas Anderson AndersonAlternative.com	241C Hogs Back Rd. Millville, PA 17846

Commentator ID #	Name	Address
42	Jesse Lytle Haverford College	370 Lancaster Ave. Haverford, PA 19041
43	Dave Engle	287 Churchill Street Dushore, PA 18614
44	Chuck Westerlund	6 Greenbrier Lane Willow Street, PA 17584
45	Patrick Rulong	228 Boggs Ave. Pittsburgh, PA 15211
46	Eileen Reed	1 Ebony Ct. Newtown, PA 18940
47	David Meiser Bucks Environmental Action	5526 Wismer Rd. Pipersville, PA 18947-1408
48	Joan L Farb Bucks Environmental Action and UCS org	211 Sequoia Drive Newtown, PA 18940
49	Stuart Levy 1951	66 Keenan Lane Holland, PA 18966
50	Jim Noden Bright Eye Solar LLC	1200 Corporate Blvd., Ste. 16 Lancaster, PA 17601
51	Judy Morgan	16 W. Moreland Ave. Philadelphia, PA 19118
52	Jennifer Ragen	7816 Calvert Street Philadelphia, PA 19152
53	Adam C. Choppin	1617 Fairmount Ave. Philadelphia, PA 19130
54	Craig Silbert Bucks County Biscotti	10 W. Creamery Rd. P.O. Box 241 Hilltown, PA 18927
55	Steve Cickay	263 Burgundy Lane Newtown, PA 18940
56	Donald Kane	190 Covington Road Yardley, PA 19067
57	Kathleen Maffei	4312 Springhouse Lane Aston, PA 19014
58	Syd Weinstein	3837 Byron Road Huntingdon Valley, PA 19006
59	Daniel Guest	8604 Thomas Mill Terrace Philadelphia, PA 19128
60	C. Reggiani	6254 Wissahickon Ave. Philadelphia, PA 19144
61	Kristin Faulkner	4412 West Chester Drive Aston, PA 19014-2236
62	Abigail Weinberg	431 W. Ellet Street Philadelphia, PA 19119

Commentator ID #	Name	Address
63	Neal Carson	PO Box 163 Upper Black Eddy, PA 18972
64	Robin Hoy	1048 Worthington Mill Road Newtown, PA 18940
65	Cathie Forman	1010 Woods Road Southampton, PA 18966-4543
66	Robert Donnan	107 Southview Ct. McMurray, PA 15317
67	Pauline Candaux	762 E. Passyunk Ave. Philadelphia, PA 19147
68	David Low	48 College Ave. Flourtown, PA 19031
69	Helge Hartung	312 Ogden Ave. Swarthmore, PA 19081
70	Edward Ketyer Physicians for Social Responsibility -- PA	102 Meadowvue Court Venetia, PA 15367
71	Amber Blaylock	6509 Blue Ridge Ave. Harrisburg, PA 17112
72	K.K. DuVivier University of Denver	2255 East Evans Avenue Denver, CO 80208
73	Liz Robinson Philadelphia Solar Energy Association	566 Jamestown Street Philadelphia, PA 19128
74	Peter Held	25114 Old Highway 86 Cambridge Springs, PA 16403
75	Ms. Hilary Schenker	842 Heberton Street Pittsburgh, PA 15206
76	Roy Stetler	297 Ore Bank Road Dillsburg, PA 17019-9319
77	Swamy Yeleswaram	136 Harrogate Dr. Landenberg, PA 19350
78	Marty Clemmer	3741 East Newport Road Gordonville, PA 17529
79	Jon Schrock	211 Stehman Rd. Lancaster, PA 17603
80	Anthony Volpe	502 Owlsbury Dr. Perkasie, PA 18944-4434
81	Barbara Hatch	139 Thompsonville Rd. McMurray, PA 15317
82	Leo Macdonald	280 Headquarters Rd. Erwinna, PA 18920
83	Matthew Tripoli ET Capital Solar Partners (USA), Inc.	5422 Heather Ln. Orefield, PA 18069

Commentator ID #	Name	Address
84	Rob Sackett	8720 Perry Hwy. Erie, PA 16509
85	Anna McCartney	11078 Freeport Ln. North East, PA 16428
86	Hugh McCartney	11078 Freeport Lane North East, PA 16428
87	Tim Siftar	4621 Cedar Ave. Philadelphia, PA 19143
88	Peter Yeomans	234 W. Winona St. Philadelphia, PA 19144
89	Carl Crysler	2008 School Rd. Pottstown, PA 19465
90	Ric Hopkins	49 W. Oakland Ave. Doylestown, PA 18901
91	Jon Rodkey	23 Henrietta Street Red Lion, PA 17356
92	Jonathon Wells	3936 Forest Drive Doylestown, PA 18902
93	Gregory O'Brien	102 Brookhollow Dr. Downingtown, PA 19335
94	James Weaver	1754 Oak Ct. Orwigsburg, PA 17961
95	Kathy Fox Bethlehem Environmental Advisory Council	1513 Elm Street Bethlehem, PA 18017
96	Alden Naeny	242 Poplar St. Philadelphia, PA 19123
97	Thomas Jeske	4 Red Ridge Rd. Levittown, PA 19056
98	Jim Welty Marcellus Shale Coalition	300 North Second Street Harrisburg, PA 17101
99	Jim Zubler	P.O. Box 242 Spring Mills, PA 16875
100	Sandy Field Climate Reality Project: Susquehanna Valley PA	198 Pheasant Ridge Road Lewisburg, PA 17837
101	Barry Naum Spilman Thomas & Battle PLLC	1100 Bent Creek Blvd., Ste. 101 Mechanicsburg, PA 17050
102	Mr. Robert Depew	510 Fonthill Drive, Apt. F-10 Doylestown, PA 18901
103	Derek Martin	22 N. 4th St. Lewisburg, PA 17837
104	Nicole Gear Energy Association of PA	800 N. Third Street, Suite 205 Harrisburg, PA 17102

Commentator ID #	Name	Address
105	John McCawley PECO Energy Company	S18-2, 2301 Market Street Philadelphia, PA 19002
106	Kriss Brown Pennsylvania Public Utility Commission	Commonwealth Keystone Building 400 North Street Harrisburg, PA 17105-3265
107	James Rouland PPL Electric Utilities Corporation	2 North 9th Street Allentown, PA 18101
108	Gail Brunner	180 Chicopee Rd. Damascus, PA 18415
109	Ronni Cook Concerned Citizens of Franklin County	1452 Highfield Court Chambersburg, PA 17202
110	Frances Hugg	777 Liberty Lane Hollidaysburg, PA 16648
111	Joy Bergey Enviro. Justice Ctr/Chestnut Hill United Church	8812 Germantown Ave. Philadelphia, PA 19118
112	Kevin Sunday	417 Market Street Harrisburg, PA 17101
113	Kevin Siedt FirstEnergy	2800 Pottsville Pike Reading, PA 19605
114	Shelby Linton Keddie Duquesne Light Company	800 North Third Street, Suite 203 Harrisburg, PA 17102
115	Glen Thomas PJM Power Providers Group (P3)	101 Lindenwood Drive, Suite 225 Malvern, PA 19355
116	Vera Cole Mid-Atlantic Renewable Energy Association	2045 Upper Rocky Dale Road Green Lane, PA 18054
117	David Ford SEEDS of NEPA	116 Overlook Ln. Honesdale, PA 18431
118	Alessandra Hylander Counsel to Pennsylvania Energy Consumer Alliance	100 Pine Street Harrisburg, PA 17101
119	Nicole Sitaraman Sunrun	44 Tuckerman Street, NW Washington, DC 20011
120	Lisa Schaefer County Commissioners Association of PA	2789 Old Post Road Harrisburg, PA 17110
121	Jim Kurtz RER Energy Group	4700 Pottsville Pike Reading, PA 19605
122	Philip Jones EMS Environmental, Inc.	4550 Bath Pike Bethlehem, PA 18017

Commentator ID #	Name	Address
123	Stephen Riccardi PennEnvironment Research & Policy Center	1429 Walnut St., Ste. 1100 Philadelphia, PA 19102
124	Henry McKay Solar United Neighbors of Pennsylvania	327 Whipple St Pittsburgh, PA 15218
125	Grant Gulibon Pennsylvania Farm Bureau	510 South 31st Street Camp Hill, PA 17001
126	Megan Chellew	2403 E. Letterly St. Philadelphia, PA 19125
127	Alexandra Wyatt GRID Alternatives	1629 Benning Rd., NE Washington, DC 20002
128	William Barnett	62 Twin Pond Way Hawley, PA 18428
129	Dave Blair	101 South Louis Court Monaca, PA 15061
130	Richard Bloom	1181 Colver Rd Ebensburg, PA 15931
131	Brian Smith WGL Energy	8614 Westwood Center Dr. Ste. 1200 Vienna, VA 22182
132	Jessica Ennis Earthjustice	1617 JFK Blvd., Ste. 1130 Philadelphia, PA 19103
133	Pari Kasotia Vote Solar	2450 Virginia Ave., NW, Unit E609 Washington, DC 20037
134	Richard Van Aken	68 Murray Rd. Churchville, PA 18966
135	Raymond Kadingo	6 Heather Lane Reading, PA 19601
136	Daniel Erdman	329 Ruby St. Lancaster, PA 17603
137	Adam Beam Delaware Valley Regional Planning Commission	190 N. Independence Mall West 8th Fl. Philadelphia, PA 19106
138	Tony Orr Dynamic Energy	1550 Liberty Ridge Drive Suite 310 Wayne, PA 19087

COMMENTS SUPPORTIVE OF SOLAR

1. **Comment:** The commentators noted that solar and clean renewable energy are a source of jobs and economic value for Pennsylvania and necessary to remain economically competitive. (1, 29, 35, 39, 42, 45, 46, 52, 53, 56, 62, 64, 70, 71, 83, 85, 89, 108, 111)

Response: The Department agrees and believes the report documents this fact.

2. **Comment:** The commentator expressed support for solar and/or movement away from carbon intensive fuels while noting the need to respond to climate change and other environmental and/or public health concerns. (1, 2, 8, 13, 27, 29, 34, 40, 42, 49, 51, 52, 53, 55, 62, 63, 64, 68, 70, 71, 72, 90, 91, 95, 100, 103, 108, 109, 110, 111, 116, 122, 123, 126, 128, 129, 130, 132, 134)

Response: The Department agrees that the adoption of renewable generation like solar energy is important to effectively limit the magnitude or rate of climate change.

3. **Comment:** The most cost-effective means to boost solar production is through large solar farms. (2, 3)

Response: The Department notes that the modeling in the report was based on this assumption.

4. **Comment:** Commentator reports his family was able to make their home a net-zero home in part due to solar energy. (10, 129)

Response: The Department thanks the commentators for their comments.

5. **Comment:** Pennsylvania has the technical and economic potential to significantly increase solar generation. (13, 22, 58)

Response: The Department agrees.

6. **Comment:** The commentator supports the Solar Future Plan and a statewide target of 10 percent solar generation. (15, 16, 22, 23, 26, 28, 31, 92, 93, 97, 108, 123, 135)

Response: The Department appreciates the commentators support.

7. **Comment:** The commentator supports the 10 percent solar generation target, but indicates higher levels of solar either may be attainable or would be a better goal. (26, 28, 31, 32, 37, 55, 92, 97, 101, 109, 116)

Response: The Department appreciates these comments and notes that the 10 percent target in this plan was established to provide a baseline for this analysis—it was not intended to be a recommendation on its own.

8. **Comment:** The commentator expressed support for expansion of solar in Pennsylvania provided it can be implemented in a cost-effective way that maintains safe and reliable electric service to all customers. (17, 104, 107)

Response: The Department appreciates this comment and agrees that maintaining reliable electricity service is an important concern and a factor considered by the stakeholder group.

9. **Comment:** The commentator supports solar as a component of our energy portfolio. (17, 125)

Response: The Department agrees and appreciates the support of the PA Solar Future Plan.

10. **Comment:** The commentator notes that they have installed solar panels and report positive outcomes including: lower electricity bills, reduced carbon pollution, more reliable power, and providing power for neighbors. (24, 65, 66)

Response: The Department thanks the commentators for their comments.

11. **Comment:** The commentator supports growing the solar industry in Pennsylvania. (25, 65, 67, 92, 97)

Response: The Department appreciates these comments.

12. **Comment:** The commentator supports subsidies for solar power in Pennsylvania but specifically does not support additional nuclear subsidies. (27)

Response: The Department thanks the commentator for the comment.

13. **Comment:** The commentator supports a rapid transition away from fossil fuels and finds it unacceptable to deny the long-term benefits for short-term financial gains. (31)

Response: The Department appreciates these comments.

14. **Comment:** The commentator particularly supports distributed and rooftop solar. (38, 44, 50, 74, 75, 76, 77, 78, 79, 80, 81, 82, 84, 85, 86, 87, 88, 89, 93, 99, 116, 119, 121, 124, 131, 136, 133)

Response: The Department notes that while this plan's scenarios reflect more grid-supply solar than rooftop solar, those scenarios are included to aid modeling and analysis and should not be considered a recommendation for any particular percentage of the amount of solar to be deployed. While grid-supply solar is typically more cost-effective than distributed solar, and this may lead to greater deployment, the Department recognizes that distributed generation is a cost-effective solution for many applications.

15. **Comment:** The commentator highlighted that solar and energy efficiency complement one another. (52)

Response: The Department agrees and has included increased energy efficiency as part of the modeled scenarios.

16. **Comment:** The commentator highlighted that solar and electric vehicles complement one another. (53)

Response: The Department agrees and has included increased electric vehicles as part of the modeled scenarios.

17. **Comment:** The commentator identified security concerns as a reason to adopt distributed solar generation. (70, 86)

Response: The Department agrees that energy security is an important issue and solar generation, particularly in conjunction with microgrid technology, can be an effective tool.

18. **Comment:** The commentator states that the plan is appropriately organized identifying cross-cutting strategies, grid-supply strategies and customer-owned solar separately. (107)

Response: The Department appreciates the comment.

19. **Comment:** The commentator supports solar and states that air pollution from fossil fuels unfairly targets those in poverty. (111)

Response: The Department appreciates the comment.

COMMENTS SUPPORTIVE OF SPECIFIC PLAN ELEMENTS

20. **Comment:** The commentator expressed support for carbon pricing. (13, 42, 53, 100, 116, 130, 133, 135)

Response: The Department thanks the commentators for the comment.

21. **Comment:** The commentator noted that revisions of Pennsylvania's tax policy could provide incentives particularly to residential customers. (43, 47, 57, 63, 92, 97, 138)

Response: The Department thanks the commentators for the comment.

22. **Comment:** The commentator supports increased access to capital through solar lending products, low-interest loans, and access to PACE programs. (54, 56, 57, 67, 92, 97, 100, 135)

Response: The Department appreciates the comment.

23. **Comment:** The commentator supports increasing the AEPS solar share to the 4 to 8 percent range. (2, 57, 119, 127, 133, 138)

Response: The Department appreciates the comment.

24. **Comment:** The commentator expressed support for virtual net metering, community solar and other measures to increase access to solar. (95, 100, 131, 132, 133, 138)

Response: The Department appreciates the comment.

25. **Comment:** The commentator expressed support for utility ownership. (100, 114)

Response: The Department thanks the commentators for the comment.

26. **Comment:** The commentators support efforts to locate solar on marginal or underutilized lands (e.g. landfills, brownfields, and abandoned mines). (15, 59, 125, 127, 138)

Response: The Department appreciates the comment.

27. **Comment:** The commentator specifically supports establishment of a green bank to leverage public funds for solar expansion. (119)

Response: The Department appreciates the comment.

28. **Comment:** The commentator supports policies that increase the price of SREC credits. (11, 14, 18, 40, 69)

Response: SREC prices were the subject of significant discussion among the stakeholders. This resulted in the inclusion of strategies in the report to limit out-of-state SRECs (which has already been implemented through Act 40 of 2017) and strategies to further increase AEPS targets.

29. **Comment:** The commentator stated that demand charges and fixed charges can undermine renewable energy goals, and that rate design should be simple and clear to consumers. (119)

Response: The Department agrees with the commentator and has edited the plan accordingly.

30. **Comment:** The commentator states that thoughtful land-use planning that considers local input is critical regardless of the type of development. (120)

Response: The Department agrees with the commentator and believes this position is reflected in the plan.

31. **Comment:** The commentator specifically notes the need for access to capital and lower interest rates for the residential and commercial markets. (51, 133)

Response: The Department agrees, recognizing that access to capital is an important issue and will continue to address that as we develop a strategy support guide.

32. **Comment:** The commentator notes that certain tax policies are effectively subsidies and should be thoughtfully evaluated. (115)

Response: The Department agrees that any tax policy should be thoroughly analyzed and evaluated prior to being implemented.

33. **Comment:** The commentator expressed support for the elements of the plan related to the promotion of end-user investment in solar resources and the economic benefits that would be brought to Commonwealth residents. (101)

Response: The Department appreciates the comment.

TECHNICAL COMMENTS AND RECOMMENDATIONS

34. **Comment:** The commentators noted the expiration of the Investment Tax Credit (ITC) provides a reason for urgency. (15, 16, 131)

Response: The Department appreciates the comment.

35. **Comment:** The commentator expressed concern with cost shifting from net-metered customers to those without solar and notes that while the report mentions alternative rate making as a solution, no specific design was proposed. (21)

Response: The Department agrees a more detailed analysis of rate designs would be helpful, and notes that enabling legislation for alternative rate making was signed by Governor Wolf and the Public Utility Commission has recently opened a docket on their implementation rules.

36. **Comment:** The commentator notes that farms, townships, and counties could particularly benefit from the siting of grid-scale solar. (22)

Response: The Department agrees and thanks the commentator for the comment.

37. **Comment:** The commentator states that the existing net metering limits of 50 kilowatt (kW) residential and 5 megawatt (MW) commercial owners acts as a disincentive to install solar. (47)

Response: The Department thanks the commentator for the comment and recognizes that the outright removal of those limits creates policy issues which may impact other renewable energy generation sources. The Department further notes that the current limits apply to all net-metered sources, not just solar (e.g. methane digesters and landfill gas generators) and were intended to prevent wholesale generators from receiving retail prices for their generation as well as to protect utilities from excessive loss of revenue.

38. **Comment:** Utility interconnection application fees are excessive. (47)

Response: The Department recognizes that interconnection fees can be a factor in the decision to install solar, and these could be addressed through a process before the Pennsylvania Public Utility Commission.

39. **Comment:** The commentator specifically notes that predictability in the levels of net metering will help consumers to justify the costs of solar. (58)

Response: The Department agrees and notes that the Governor recently signed into law Act 40 of 2017, which may mitigate the extent to which out-of-state solar deployment causes variation in Pennsylvania's SREC prices.

40. **Comment:** The commentator recommends the Commonwealth of Pennsylvania to take a holistic approach to planning its clean energy future. This includes exploring topics of solar, wind, nuclear, storage, alternative ratemaking, grid modernization, smart grid, and other ancillary topics in tandem rather than as stand-alone, isolated topics. (133)

Response: The Department thanks the commentator for the comment. The Finding PA's Solar Future Project is one of several planning and scoping efforts which are evaluating various aspects of Pennsylvania's potential for implementation of clean energy generation technologies. The PA Solar Future Plan will help to inform a broader review and planning activities inclusive of all the topics identified.

41. **Comment:** The commentator supports targeted marketing, education and outreach to communities by trusted organizations, presenting information in a language- and energy literacy- appropriate manner. (127)

Response: The Department agrees and expects the implementation phase of the project to discuss those strategies.

42. **Comment:** The commentator notes that solar energy systems are often an integral part of a farm's plan to meet environmental standards, therefore allowing policies that devalue Solar Renewable Energy Credits (SRECs) limit options for compliance. (125)

Response: The Department thanks the commentator for the perspective.

43. **Comment:** The commentator notes that solar is attempting to compete with a fossil fuel industry that has been highly subsidized, and that it is unreasonable to compare a developing industry with more mature generation. (117)

Response: The Department appreciates the commentator's perspective and that policies should be thoroughly analyzed and evaluated.

44. **Comment:** The commentator states that joining a carbon pricing program would require legislation and that the best way to address carbon is through a region-wide market-based construct. (115)

Response: The proposed strategy to implement a carbon pricing program discusses several models for carbon pricing. While some models may require legislation, others may not.

45. **Comment:** The commentator notes that because of the drop in solar prices Pennsylvania is poised to catch up to nearby states at a fraction of the net economic cost. (83)

Response: The Department agrees that falling solar prices for solar installation make expansion more cost-effective.

REQUESTS FOR CLARIFICATION OR CORRECTION

46. **Comment:** The commentator requested a better explanation of the long-term contracts and how the strategy differs from the status quo, to include citing Section 54.186 of the Pennsylvania code that provides for long term contracts. (33, 83)

Response: The Department has edited the description contained in the plan.

47. **Comment:** There needs to be a supplemental, graphic based, legislative information and action summary. (33)

Response: With the finalization of the Solar Future Plan, the next step for the project involves developing a strategy support guide. In this phase materials will be developed similar to what was suggested.

48. **Comment:** The commentator suggests that the report note that while solar is often considered a commercial or industrial land use it does not require the same level of supporting infrastructure that other commercial uses might require. (83)

Response: The Department thanks the commentator for the information and has edited the plan accordingly.

49. **Comment:** The commentator suggests that the report include a discussion of Pennsylvania's comprehensive set of policies and programs that are intended to conserve and preserve agricultural and forested acreage, including Act 319, and various farmland preservation programs. (83)

Response: The Department has included a reference to Act 319 in the plan.

50. **Comment:** Table 15 of the plan should be adjusted to include fixed charges. (94)

Response: The Department reviewed the data and found that including additional fixed charges in the table does not change the result.

51. **Comment:** The commentator suggests that the two percent annual efficiency increases listed in Page 53, Section H, of plan are overly optimistic. (94)

Response: The Department disagrees that this is overly optimistic. Please note that the two percent increase is identified within the “extra/high efficiency” scenario and that there are currently six states that are increasing efficiency at a rate that is at least two percent.

52. **Comment:** The commentator suggests that the increase in heat pump usage by 18 to 40 percent is overly optimistic given the increasing production of shale gas. (94)

Response: The Census Bureau estimates about 51 percent of Pennsylvania Households have utility gas and the significant infrastructure investment required to expand that number may limit further increases. It’s expected that the growth in heat pump usage would mostly come from upgrades at the 22 percent of houses with existing electrical heating or from the 2 percent of households on bottled gas, LP, fuel oil, kerosene, or coal.

53. **Comment:** The Commentator asked that additional work be completed to explain the legislative and regulatory changes required. (107)

Response: While this phase of the Solar Future Project identified potential strategies, the stakeholders will consider implementation details while the Strategy Support Guide is under development.

54. **Comment:** The commentator recommends that the stakeholder list include only the organizations represented not the names of the individuals. (114)

Response: In the interest of maximizing free and open communication, the Department has not required participants to choose, or to state, if they are participating on behalf of their employer or in their private capacity. Every individual listed can have their name removed at any time.

55. **Comment:** The commentator notes that the plan is inadequate in explaining the need for legislative reforms to enable utility ownership. (114)

Response: While this phase of the Solar Future Project identified potential strategies, the stakeholders will consider implementation details while the Strategy Support Guide is under development.

56. **Comment:** The commentator notes that the discussion of grid modernization is excessively narrow and that if it is not expanded, the section should be re-named as “energy storage.” (114)

Response: The Department has edited the plan accordingly.

57. **Comment:** The reference to the PJM interconnection study in the executive summary does not match the full quote found later in the plan and this may distort the meaning. (113)

Response: The Department has edited the plan accordingly.

58. **Comment:** The commentator notes that the community solar section discusses brownfields and other rural lands but urges the Project Team not to dismiss community solar in urban areas. (114)

Response: The Department has edited the plan to emphasize urban areas.

59. **Comment:** The commentator recommends extending the analysis on land use section to dispel myths that any new solar development, whether for community solar or grid solar, will have an undue impact on land use. (133)

Response: The analysis presented in the plan demonstrates there is sufficient land for solar deployment. The plan further proposes additional work to be done to encourage siting on property other than prime farm or forest land.

60. **Comment:** The commentator notes that carbon pricing should acknowledge the opportunity to use revenues to benefit statewide low income solar programs or otherwise deduce the disproportionate electrical energy burden of low income ratepayers. (127)

Response: The proposed strategy suggests proceeds are reinvested in renewable energy and energy efficiency, but the Department recognizes other policy choices are possible should such a plan be implemented.

61. **Comment:** The commentator notes that any discussion of cost to consumers should recognize the positive and negative externalities. (127, 133)

Response: The discussion of the calculation of externalities occurred over several stakeholder meetings. Some stakeholders would like to see separate discussion of externalities as a sensitivity or additional analysis while others wish to not have externalities calculated at all, whether positive or negative. The Department and the modeling team attempted to balance the feedback received and discussion surrounding the details of each result. The discussion of the sensitivities around externalities may continue as the project carries forward.

62. **Comment:** The commentator urges the Plan to be clear regarding the distributional impacts of various components of the scenarios' costs and benefits. Well-designed programs promoting rooftop and community solar, in particular, can provide proportionately greater benefits to low and moderate income (LMI) communities. (127)

Response: The Department agrees that any implemented strategies should carefully consider the costs and benefits related to all rate classes particularly LMI consumers and has edited the Plan to include more of that information.

63. **Comment:** The commentator recommends that costs be differentiated between those borne by ratepayers and those costs borne by private investment. (119)

Response: The Department notes that the analysis provided in the Plan is intended to evaluate possible directions. Allocation of costs related to specific program structures

and incentives is valuable, but such data would only be valid for a specific suite of strategies planned for implementation.

64. **Comment:** The commentator states that saying the ability for utilities to own solar generation has not been addressed by the PUC or the courts is incorrect as it is prevented by the Electric Competition and Consumer Choice Act of 1996. (115)

Response: The Department believes that the plan accurately reflects the differences of opinion stated during the stakeholder process and that to date, no court has made a definitive ruling on the issue.

65. **Comment:** The commentator notes that the section on community solar would be strengthened if it identifies the barriers to community solar that are currently in place—at minimum the need for enabling legislation. (114)

Response: Implementation details, such as the need for enabling legislation will be presented in a separate Strategy Support Guide.

66. **Comment:** The commentator notes that while the “Pennsylvania gas discount” exists for wholesale markets, the city gate prices should not be compared to electricity prices. (98)

Response: The Department appreciates the comment.

67. **Comment:** The commentator states that the plan could go into more detail on integrating energy efficiency with solar generation. (73)

Response: The Department recognizes the potential for additional work in this area but notes that modeling scenarios include potential for increased energy efficiency.

RECOMMENDATIONS FOR FURTHER STUDY OR ADDITIONAL STRATEGIES

68. **Comment:** Commentator requests more detailed discussion of microgrids and their impact on solar. Specifically, how microgrids fit into the existing rate structure, how security will be ensured, and how they will share incentives. (6)

Response: The Department thanks the commentator and agrees additional work in this area would be valuable.

69. **Comment:** The commentator expressed concern with the lack of strategies enabling low and moderate income communities to obtain solar and specifically suggests investigating Colorado’s GRID Alternatives. (20)

Response: The Department thanks the commentator for the comment and will discuss these issues more during the implementation phase of the project.

70. **Comment:** The commentator notes that several economic benefits that accrue to communities following the deployment of solar have not been fully captured by the report.

These include job benefits, tax benefits from developing Act 319 lands, and related efforts needed by Pennsylvania colleges and technical schools. (83)

Response: The Department appreciates the comment.

71. **Comment:** The Commentator encourages the state to perform a detailed analysis of cost-effective locations for solar expansion that accounts for the highest and best land use opportunities. (105)

Response: The Department agrees that this information is important for wide-spread solar development in Pennsylvania and will consider it for future solar planning activities.

72. **Comment:** The commentator notes, particularly in reference to virtual net metering, that net metering at the retail rate as currently occurs may not be appropriate for all projects and notes a California study where net metered customers only paid 81 percent of their system costs. (114)

Response: The Department notes that the Pennsylvania Solar Future Plan does not make a recommendation on the appropriate level of compensation for customers using virtual net metering. As the report notes, there is a range of opinion among stakeholders and further analysis is warranted.

73. **Comment:** The commentator notes that smart inverters do not always solve the problem of adding solar to low-capacity feeders and additional research is needed to determine the capabilities and benefits. (114)

Response: The Department agrees that using smart inverter functionality will not always be a solution to interconnection application denials but is a possible tool along with other measures. PECO has, for example, conducted extensive testing of smart inverters and now includes them as a possible solution, particularly for low voltage distribution line issues.

74. **Comment:** The commentator states that now may be the time to review interconnection standards developed almost ten years ago and the fees for review should more accurately reflect the resources used to review these applications. (114)

Response: The Department agrees that interconnection standards and fees are important, and a further analysis is required to fully evaluate the issue.

75. **Comment:** The commentator notes that the plan could benefit from more analysis of the local economic and workforce impacts expanding solar will have on other energy industries. (120)

Response: The Department agrees that more analysis would be helpful, although that effort is beyond the scope of this project.

76. **Comment:** The commentator notes “DCED’s work with energy scenarios to look at the state’s broader energy system to answer the question of how that might evolve in the next 25 years and what that might mean for Pennsylvanians” and urges that Pennsylvania’s Solar Future Plan be incorporated into those more global discussions about our state’s energy future. (120)

Response: The Department thanks the commentator for the comment and notes that both DEP and DCED staff involved in the development PA Solar Future Plan have also been a part of the DCED work on the broader energy system scenario development project.

77. **Comment:** The commentator encourages the project team to engage with county assessment offices to gain a clearer and more accurate picture of the property valuation process and asks that local impacts be more clearly defined as the local tax base has seen a decline. (120)

Response: The Department notes that the main tax-incentive strategy involves a thorough study of the existing tax structure to identify potential barriers, even this study should ensure that any recommendation is sustainable for local governments.

78. **Comment:** The commentator suggested more analysis be provided on what role Electric Distribution Companies (EDCs) and utility ownership can play in providing the most cost-effective solar expansion. (105)

Response: The initial phase of this project identified potential strategies but did not evaluate specific implementation details. More analysis in this area may be conducted in the next phase of the project.

79. **Comment:** The commentator notes that while the report states that sufficient land is available, it does not provide the geographic distribution or an analysis regarding how much is suitable for large-scale development. (120)

Response: The initial phase of this project identified potential strategies but did not evaluate specific implementation details. More analysis in this area may be conducted in the next phase of the project.

80. **Comment:** Pennsylvania should adopt a solar rights law that prohibits home owners associations (HOA) from restricting solar. (4, 36, 48, 96)

Response: Such legislation was discussed during the stakeholder process, but there was little information available quantifying how much additional solar would be fielded but for restrictive HOA rules. There was also sensitivity to the fact that some communities seek to maintain the historical character of properties. While appropriate legislation could overcome these issues, another alternative would be enabling community solar, which would allow these property owners to buy or lease shares of a solar system at a remote location.

81. **Comment:** Please do what is necessary to allow Tesla to do commercial work in Pennsylvania. (12)

Response: The Department is unaware of any law or regulation preventing such work.

82. **Comment:** The commentator suggests grandfathering of existing solar as an incentive. (44)

Response: The Department notes that grandfathering of Solar Alternative Energy Credits (SAECs) has been addressed through the Public Utility Rulemaking surrounding Act 40 of 2017.

83. **Comment:** Solar should not be subject to zoning restrictions except in the case of safety. (47)

Response: While zoning has been discussed, there was also sensitivity to the fact that some communities seek to maintain the historical character of properties or have viewshed concerns. While appropriate legislation could overcome these issues, another alternative would be enabling community solar, which would allow property owners to buy or lease shares of a solar system at a remote location.

84. **Comment:** There should be either incentives or legislation to require large developers to install solar PV on new construction. (47)

Response: This was not a proposal that was specifically discussed by the stakeholders, but it is possible that some of the incentives discussed could benefit developers who install solar. Additional outreach to such builders would be necessary before any recommendations could be made. We note that requirements for solar to be installed on certain new buildings or requirements that new construction be “solar ready” have been considered in other states. Absent specific legislation, such a requirement would need to be addressed through Pennsylvania’s building codes process.

85. **Comment:** Offering attractive loans to commercial customers, particularly those for systems under 1MW, would be a great incentive. (50)

Response: The Solar Future Plan recognizes that access to capital is an important issue, but the Project Team did not specifically highlight the needs of the small commercial market. That is something that we can address as we develop the Strategy Support Guide.

86. **Comment:** The commentator recommends prioritizing the use of publicly owned highways and bridges as well as other areas that require clearance of existing vegetation. (59)

Response: While the Solar Future Plan has identified possible strategies, the next phase of the project will begin to analyze implementation issues such as these.

87. **Comment:** The commentator recommends piloting energy storage systems to mature that aspect of the technology and eliminate the concerns around clouds and rain. (59)

Response: Energy storage systems were discussed during the planning process as a technology that can enable higher solar penetration but also as a technology with broader applications beyond the scope of the plan. While storage was not identified as a strategy in the plan, this does not imply it would not be a valuable addition to our energy system.

88. **Comment:** The commentator recommends starting the process with municipal and state buildings to set the example. (60)

Response: The Commonwealth has participated in incentivizing the deployment of Solar over the last 15 years by to demonstrate the capabilities and benefits of solar across all sectors, residential, commercial, industrial properties, and grid scale solar. Programs such as the PA Sunshine Program, and the Commonwealth Financing Authority's Solar Program have contributed greatly to the over 300 MW of solar installed, the examples have been set. The PA Solar Future Plan's goal is to learn from this progress and then take solar deployments beyond examples in communities and scaling deployment to return scalable economic and environmental results.

89. **Comment:** The commentator supports California's mandate on solar for new construction. (60)

Response: The Department thanks the commentator for the comment and recognizes that there are additional potential strategies besides what stakeholders have identified during the Solar Future Plan process.

90. **Comment:** The commentator states that the plan should strengthen its recommendations in regard to workforce training. (73, 100)

Response: The Department agrees that workforce training and development is an important aspect of reaching PA Solar Future's goals. The Department expects further discussion and development of action items during the implementation phase of the plan as well as identification of further studies specifically focused on the efforts necessary to increase and strengthen Pennsylvania's solar workforce.

91. **Comment:** The commentator recommends strengthening the net metering rules to ensure customer generators receive the full retail value for the solar generated. (74, 75, 76, 77, 78, 79, 80, 81, 84, 85, 88, 124)

Response: The Department notes that the existing AEPS law specifies that customers should receive full retail value for excess energy generated month-to-month with excess annual generation being paid for at the price to compare, which includes generation and transmission costs. The stakeholders have noted that the value of solar has not been formally quantified for this purpose and that represents another possible avenue of research.

92. **Comment:** The commentator recommends that more incentives be added to cross-cutting strategies. (100, 130)

Response: The Department appreciates the comment and recognizes that there are additional potential strategies besides what stakeholders have identified during the Solar Future Plan process.

93. **Comment:** The commentator suggests that future implementation plans explore how use of the existing competitive retail electricity markets can expand solar. (104, 105, 118)

Response: The Department appreciates the comment and recognizes that there are additional potential strategies besides what stakeholders have identified during the Solar Future Plan process.

94. **Comment:** The commentator noted the potential for modernizing regulatory treatment of distributed energy resources to account for the costs and benefits of bidirectional distributed grid integration through Advanced Metering Infrastructure (AMI) networks. (105)

Response: The Department thanks the commentator for the comment and agrees that valuation of distributed resources warrants further analysis.

95. **Comment:** The commentator noted smart inverter technology solutions can aid in assignments of costs of distribution system upgrades but alternatives to case-by-case cost causation may be valuable. (105)

Response: The Department agrees and will continue to investigate this issues into the next portion of the project.

96. **Comment:** The Commentator asked that additional options be provided supporting utility scale solar expansion. (107)

Response: The Department appreciates the comment and recognizes that there are additional potential strategies besides what stakeholders have identified during the Solar Future Plan process.

97. **Comment:** The commentator supports collaboration with local communities and organizations on siting to promote visibility and community connection. (127)

Response: The Department thanks the commentator for the comment.

98. **Comment:** The commentator supports thoughtfully designed consumer protection measures, disclosures, and accountability measures to ensure that financially vulnerable customers are not taken advantage of or otherwise compromised. (127)

Response: The Department agrees that no customers should be taken advantage of when considering solar. While the plan is not meant to be an educational reference for consumers looking to purchase solar, consumer protections are important for any

persons considering purchasing a solar energy system. The PA PUC has recently added some basic answers to frequently asked consumer questions on solar energy to their website that may be of assistance. This information is available at http://www.puc.pa.gov/Electric/pdf/Renewable/FS-Solar_FAQ.pdf.

99. **Comment:** The commentator supports government procurement or incentives to secure anchor participants to underwrite low-credit participants and mitigate investor risk. (127)

Response: The Department appreciates the comment.

100. **Comment:** The commentator supports funding for pilot projects directed specifically at low-income subscribers and funding for development or acquisition of program management software for LMI community solar projects or programs. (127)

Response: The Department thanks the commentator for the comment.

101. **Comment:** The commentator supports tailored program rules to maximize benefits to and encourage participation by affordable housing providers. (127)

Response: The Department appreciates the comment.

102. **Comment:** The commentator notes regarding utility ownership that utilities should be required to work with entities experienced with low-income solar, affordable housing, etc. to ensure maximum benefits flow to customers. (127)

Response: The Department thanks the commentator for the comment.

103. **Comment:** The commentator supports targeted incentives and credit support for community solar to facilitate direct low-income participation and maximize benefits for participants (e.g. subscriptions should be sized and structured to achieve meaningful savings, ideally monthly electricity bill reduction of 50 percent or more). (127)

Response: The Solar Future Plan has identified possible strategies, the next phase of the project will begin to analyze implementation issues such as these.

104. **Comment:** The commentator supports grants and technical assistance for industry and nonprofit partners to facilitate solar project development. (127)

Response: The Department appreciates the comment.

105. **Comment:** The commentator request more cross cutting measures be added to support both grid-supply and distributed solar. (129)

Response: The Department recognizes that more strategies could be developed for each sector. The strategies reflected in the Solar Future Plan are those identified during the stakeholder process and are not a complete list of all possible strategies.

106. **Comment:** The commentator notes that state implementation of low-income solar energy assistance programs and use of federal funds such as the Weatherization Assistance Program (WAP) and (LIHEAP) can be effective. (127)

Response: The Department appreciates the comment and has edited the plan to note this possibility.

107. **Comment:** The commentator supports state standards for commercial solar energy conversion systems that protect private property rights and allow for reasonable development of projects. (125)

Response: The Department thanks the commentator for the comment.

108. **Comment:** The commentator supports allowing landowners the option of terminating a solar lease agreement if solar panels fail to produce energy for a period longer than 12 consecutive months. (125)

Response: The Department appreciates the comment.

109. **Comment:** The commentator supports allowing preserved farms to produce and harvest energy, including solar energy, without penalty provided minimal preserved acreage is impacted. (125)

Response: The Department appreciates the comment and notes that preservation and conservation are very important to DEP. The PA Solar Future Plan will seek balance in development of solar such that the benefits of solar development and deployment are maximized and impact to the land is minimized.

110. **Comment:** The commentator supports prohibiting municipalities from banning private use of solar panels. (125)

Response: While the Department encourages municipalities to allow broad access to solar, it recognizes that some communities seek to maintain the historical character of properties or protect viewsheds. While appropriate legislation could overcome these issues, another alternative is enabling community solar, which would allow property owners to buy or lease shares of a solar system at a remote location.

111. **Comment:** The commentator supports exempting solar energy systems constructed for the purpose of on-site electricity, heating, or cooling use from real property tax for eight years. (125)

Response: The Department appreciates the comment.

112. **Comment:** The commentator recommends strategies that allow consumers to shop for generation from source sited in Pennsylvania. (116)

Response: While Pennsylvania’s Electric Choice program currently allows consumers to shop for generation service that includes clean energy, the Department recognizes that residential customers, in particular, can be unaware of this program.

113. **Comment:** It should be a priority of the project to objectively identify fair compensation mechanisms for excess energy sold by customer-generators to EDCs. (105)

Response: The Department agrees that it is important to ensure EDCs maintain funding levels adequate to ensure reliable electricity service.

114. **Comment:** Businesses need incentives to help them understand the value of solar and aid them in addressing external energy issues. (122)

Response: The Department appreciates the comment and intends to address this issue in the next phase of the project.

115. **Comment:** The commentator requests policies that provide solar access to families and small businesses. (61)

Response: While there are many possible policies that could be implemented, the stakeholders noted the access to community solar and commercial property assessed clean energy (C-PACE) are two key strategies for solar access in addition to programs that ease access to capital. These are reflected in the plan.

116. **Comment:** The commentator expressed support for more efforts towards grid modernization. (100)

Response: The Department thanks the commentator for the comment.

117. **Comment:** The commentator notes that interconnection and permitting soft costs continue to be a barrier and recommends additional work be done on streamlining the interconnection process as well as using other tools such as smart meters. (119, 137)

Response: The Department agrees that additional analysis in this area is warranted and believes this should be a cooperative effort involving the state’s EDCs.

118. **Comment:** The commentator notes that the Solar Future Plan lacks “a bottom-up, decentralized means of achieving the stated goals, namely by removing roadblocks, regulations, and disincentives for homeowners and farms to disconnect from the grid. Even in the distributed generation strategies considered, it is a grid connected and centrally planned paradigm.” Commentator suggests that if grid and fossil fuel subsidies were eliminated, off-the-grid distributed systems would be cost-effective and this strategy could achieve more than the stated 10 percent goal. (41)

Response: Aside from discussion of micro-grids that can be operated in island-mode separate from the grid, the project stakeholders did not raise the issue of encouraging off-the-grid distributed solar development as a key strategy in achieving 10 percent solar generation by 2030. Because this strategy was not modeled or discussed by the

stakeholders, we are unable to add it to the report. We recognize, however, that the included strategies are not the only available tools to expand solar.

119. **Comment:** The commentator notes that utilities must upgrade their infrastructure. (47)

Response: This issue was raised during the stakeholder process, but the Department believes that the issue must be addressed by individual utilities in conjunction with the PUC.

120. **Comment:** The commentator states that carbon limits are probably the best way of allocating costs to society in a fair and equitable manner. (117)

Response: The Solar Future Plan includes a strategy on carbon pricing to incentivize solar. Such a carbon pricing mechanism could be implemented that includes a carbon limit.

121. **Comment:** A better option for microgrids would be to have PA invest specifically in identifying and developing strategically placed communities as micro-grids with solar technology assisting in their operation portfolio. (6)

Response: The Department recognizes the potential for more work to be done identifying such communities.

122. **Comment:** More work needs to be done to provide municipalities guidance on how to expand solar. (37)

Response: Having finalized the Solar Future Plan, the next step for the project involves developing a strategy support guide. In this phase, the stakeholder group will address issues similar to what was suggested.

TECHNICAL AND LEGAL CONCERNS

123. **Comment:** Solar and wind energy is intermittent and must be stored; storage is not up to the task. (5, 9)

Response: As the report documents, renewable resources are intermittent, but our power grid operator, PJM Interconnection LLC, has extensively studied the topic and found our grid could support up to 30 percent renewable energy with existing technology. Improvements in storage technology will make solar a more flexible resource, but at the levels of solar utilization this report contemplates, storage is not required.

124. **Comment:** Pennsylvania does not have enough sunny days for solar to be a viable option. (9)

Response: While solar is most efficient in direct sunlight, today's solar panels allow for significant generation even on cloudy days. Modeling and experience show that

Pennsylvania has more than sufficient technical potential to support an additional 11GW of solar generation.

125. **Comment:** The commentator is concerned that opening the door to utility ownership of grid-scale generation would risk returning Pennsylvania to full utility regulation. (101)

Response: It is acknowledged that this concern exists within a segment of the stakeholder group and that particular care should be taken prior to implementation of this strategy, and to adjust as necessary, to ensure activities relative to this strategy does not adversely affect existing markets.

126. **Comment:** The commentator states that the less-restrictive standards for virtual net metering suggested in the Plan are not permissible under existing Public Utility Commission regulation. (113)

Response: The Department notes that certain restrictions would require statutory to changes, while others may fall within the PUC's authority to change by regulation.

127. **Comment:** The commentator states that to date solar projects have not typically provided ancillary services to the market. (113)

Response: The Department thanks the commentator for the comment.

128. **Comment:** The commentator notes that the 2008 study on rooftop solar potential is outdated and there may be greater potential. (119)

Response: The Department agrees with the commenter that a revised study could be conducted on the technical potential of rooftop solar in Pennsylvania. Since the solar PV systems are more efficient today than in 2008, solar PV arrays can now, in a cost-effective manner, cover more rooftop area, which are partially shaded or face a broader range of orientation, relative to facing south.

129. **Comment:** The commentator opposes laws that pre-empt local control over land use policies for the siting of infrastructure and is concerned with the plans proposal for uniform policies to streamline siting. (120)

Response: The Department recognizes the important role of local governments in land use planning and notes that uniform policies can be established in cooperation local governments.

130. **Comment:** Pennsylvania should not reinstate centralized generation planning beyond what has already occurred with the existing AEPS statute. (118)

Response: The Solar Future Plan represents strategies that could be considered should policy-makers decided to significantly increase solar generation. The Department assumes that the costs and benefits will be weighed accordingly prior to any such decision.

131. **Comment:** The commentator opposes increasing the AEPS solar carve-out as described in the plan noting that solar is increasing in Pennsylvania without this action. (115)

Response: The Department thanks the commentator for the comment.

132. **Comment:** The commentator expresses concern regarding utility loan programs without a more complete vetting of the suggestion given the highly regulated and inflexible nature of utilities. Instead, it is recommended that the plan focus on other mechanisms such as alternative ratemaking, community solar, and utility ownership. (114)

Response: The Department appreciates the comment.

133. **Comment:** The commentator disagrees that guidelines are what is necessary to promote long term contracts and instead notes that the barrier is that current offerings are inconsistent with the utilities obligation to act in a reasonable and prudent manner. (114)

Response: The Department recognizes that utilities have the legal authority to enter in to long-term contracts. The “guidelines” referred to in the plan are intended to assist in the development of offerings that are consistent with utility obligations.

PROJECT PLANNING PROCESS CONCERNS

134. **Comment:** The commentator recognized the Department’s efforts to include a diverse base of stakeholders but expressed concern that the voice of energy consumers is not adequately represented among the stakeholders. (101)

Response: The Department recognizes the commentator’s concern that the self-selecting nature of any stakeholder process may result in underrepresentation of a certain group. As the project moves forward developing additional materials related to supporting the strategies, we recognize that additional outreach may be necessary.

135. **Comment:** The commentator does not believe the plan should be viewed as an objective academic study of solar-potential. (104)

Response: The Department thanks the commentator for the comment and notes that the Solar Future Plan was intended to present possible pathways to significantly increase solar deployment in Pennsylvania. While the plan references studies of solar potential, it was not intended as a solar potential study.

136. **Comment:** The commentator notes that while the Solar Future project has over 500 stakeholders only a fraction of them have been actively engaged in the process or have endorsed the outcomes and are concerned that the plan will be presented as a consensus document and used to influence policy makers. (98, 104, 107, 114)

Response: The Department does not intend to imply that consensus was reached on any particular strategy or in support of the 10 percent planning target. These discussions have identified strategies that have the potential to increase solar, and

have identified potential benefits, but further analysis is warranted before some measures are implemented. The plan was edited to clarify this point.

137. **Comment:** The commentator notes that the 10 percent goal was decided by the project team in advance of the first stakeholder meeting and not as a result of considering feasibility, costs, or impacts. (104, 114, 120)

Response: The Department notes that the 10 percent target was established as a reasonable, yet beyond business-as-usual planning target around which the analysis could proceed. It was not intended as a recommendation on its own.

138. **Comment:** The report should delete the text saying it is “seeking to challenge the narrative that solar can’t work in Pennsylvania.” (112)

Response: The Department has edited the plan accordingly.

139. **Comment:** The commentator states that the modeling and data analysis remained separate and apart from the stakeholder discussions. (104).

Response: The Department notes that modeling staff were present at all stakeholder meetings and breakout sessions, and changes to both the modeling and the final plan resulted from this coordination. Furthermore, the modeling supports the plan and was presented at each meeting to help create questions and dialogue during the stakeholder breakout sessions. Over time, modeling, outputs and discussions became more coordinated with the input from stakeholders.

140. **Comment:** The majority of the plan’s strategies would require regulatory or legislative change, such “heavy lifts” impedes the plan itself, and several potentially less expensive strategies were not explored. (104)

Response: The Department notes that the strategies in the plan are not formal recommendations but potential tools that could be considered assuming appropriate policy makers decide to advance solar deployment in Pennsylvania. The Department also notes that strategies included in the plan resulted from stakeholder input and are neither a complete list of possible strategies, nor a list of the most cost-effective measures. While the commentator is correct to assume that certain strategies would require significant effort to be implemented, we note that legislation related to three of the issues identified was enacted into law during this process.

141. **Comment:** The commentator states that the plan limits the role of utility ownership to only those projects that are not market-driven, even though EDCs are in the best position to implement components of the plan effectively and efficiently. (113, 114)

Response: While the Solar Future Plan notes that public goals or reliability concerns, which are not sufficiently recognized or achieved by market driven deployment, may be best solved by utilities, the Department does not intend to imply that this is the only potential role for utility ownership.

142. **Comment:** The commentator notes that the 10 percent appears high and would require a significant acceleration of solar deployment. (105)

Response: The commentator is correct that achieving 10 percent solar in the timeframe anticipated would be a significant acceleration. The Department notes, however, that the 10 percent goal was established as a planning target around which the analysis could proceed. It was not intended to be a recommendation on its own.

143. **Comment:** The commentator is concerned that little analysis was completed to describe the significant legislative changes that may be required and the excess burden placed on EDCs. (107)

Response: The Solar Future Plan identifies strategies raised through the stakeholder process but has not yet analyzed the implementation issues in detail. The Department agrees that many of the strategies would require legislative change. The Department further recognizes the importance of utilities maintaining the ability to provide reliable electric service.

144. **Comment:** The commentator recognizes the 10 percent target is presented for the purposes of planning and is not intended as a mandate, but opposes any future attempt to make it a mandate arguing that further mandates would be disruptive of capital markets and raise electricity costs. (98)

Response: The Department recognizes the commentator's concerns and notes that while this plan documents strategies that could accelerate solar deployment, it does not make recommendations regarding implementation. However, the modeling shows that achieving 10% in-state solar generation is both technically and economically feasible, with a small increase (<1.5%) to annual energy spending.

145. **Comment:** The report does not outline possible deployment scenarios of "up to 10 percent," instead it is focused around a single 10 percent scenario. (112)

Response: While the scenarios presented in the Plan focused on the 10 percent target, the modeling includes a wider range of possible targets: 8, 10, and 12 percent. The 8 percent and 12 percent scenarios were discussed in the Modeling Section as well as the provision of results in the Appendix. The Department also notes that the 10 percent target was created for planning purposes and to identify strategies. Any actual implementation plan may set a different target.

146. **Comment:** The final report should include a description of what outcomes can be achieved without costly policy mandates. (112)

Response: The Department notes that the Solar Future Plan includes voluntary measures as well as potential mandates. While it's not possible to establish detailed a cost-benefit analysis of each strategy in isolation, the Department recognizes that such an analysis should be conducted prior to implementation that recognizes the suite of strategies selected. Modeling shows that achieving 10% in-state solar

generation is both technically and economically feasible, with a small increase (<1.5%) to annual energy spending.

147. **Comment:** The report does not include substantial discussion of net metering, storage, vehicle electrification, or heat pumps. It should include an examination of how each of the technologies interact with market demand and policy. (112)

Response: The Department agrees that additional modeling and analysis of non-solar technologies that impact solar deployment could be valuable. This was a stakeholder driven process and the report reflects the discussion at the stakeholder meetings which were primarily focused on solar and solar technologies. While enabling technologies were included and discussed as a part of the sensitivity analysis, additional discussion of how each of the technologies interact could be a part of an ongoing analysis in the next phase of the project.

148. **Comment:** The commentator disagrees with the characterization of the 10 percent planning target as “ambitious” as other nearby states are requiring more. (127)

Response: The Department recognizes that the state has the technical and economic potential for considerably more than the 10 percent goal modeled in this plan, but it also recognizes that Pennsylvania is currently at 0.25 percent (300 MW) and has a regulatory mandate of 0.50 percent (600 MW) by 2021. Based on the current status, an increase to 10 percent by 2030 (11 GW) would require a significant ramp up of deployments.

149. **Comment:** It does not appear that local governments were actively engaged in the stakeholder process. (120)

Response: Even though the stakeholder process is open to any interested party, the self-selecting nature of participation can result in some perspectives being under-represented. As such, the Department continues to welcome new stakeholders and perspectives and is continuing to conduct outreach through-out the project.

150. **Comment:** The commentator suggests that strategies to join RGGI or other multi-state carbon pricing efforts are outside the scope of this plan and should be removed. (114)

Response: The Department recognizes that a carbon pricing strategy is not narrowly focused on promoting solar but notes that the strategy of implementing carbon pricing was raised by and discussed by stakeholders throughout the process.

151. **Comment:** The commentator takes objection to the fact that the topic of utility ownership includes a disclaimer that stakeholder views vary while other issues do not, thus implying other topics achieved consensus. (114)

Response: The Department agrees and has edited the plan accordingly.

152. **Comment:** The commentator states that the draft Solar Future Plan fails to acknowledge much of the EDCs’ input. (113)

Response: The Department has attempted to acknowledge and incorporate a wide-range of stakeholder input and remains open to further discussion with all stakeholders.

FINANCIAL & MARKET CONCERNS

153. **Comment:** Commentator expressed opposition to taxpayer support of solar deployment. (5, 9, 19)

Response: The Solar Future Plan presents a number of different strategies, many of which act to remove barriers and enable consumer access to solar without requiring government funding. To the extent that funding is necessary to implement a particular strategy, it is expected that policymakers will weigh the value of such an investment appropriately.

154. **Comment:** Commentator expressed opposition to taxpayer support of solar deployment for affluent homeowners, but stressed that we should not subsidize polluters either. (53)

Response: The Solar Future Plan presents a number of different strategies, many of which act to remove barriers and enable consumer access to solar without requiring government funding. To the extent that funding is necessary to implement a particular strategy, it is expected that policymakers will weigh the value of such an investment appropriately.

155. **Comment:** Solar and wind energy should stand on their own in the free market. (5, 19, 53)

Response: The Department thanks the commentator for the comment.

156. **Comment:** The commentator notes that conservative projections were utilized for the decline in the capital cost of distributed and grid-scale projects, for grid integration costs, for rates of return sought by homeowners and investors, and for cost increases from competing sources of electricity generation. (83)

Response: The Department thanks the commentator for the comment and believes that the projections included in the plan can reasonably be met or exceeded.

157. **Comment:** The commentator invested in solar in 2011 and declining SREC prices have extended the payback period to over 20 years. Commentator claims solar is not currently a good investment. (5)

Response: The Department notes that the benefit of a solar project depends on a number of factors including the price of installation; the cost of capital; the potential generation at the planned site; current and predicted electricity prices; and the value of tax incentives, SRECs, and other environmental and local economic benefits. Since 2011, the median installed price for solar systems has dropped from over \$6.00 per Watt to, in some cases, under \$3.00 per Watt making solar a better investment over time while still returning the same environmental and local economic benefits. Further, the decline in SREC prices was a topic of discussion among the stakeholders

and was addressed by Governor Wolf by signing Act 40 of 2017. In addition, the Plan aims to further increase the value of solar investment by recommending an increase to the AEPS targets in the near future.

158. **Comment:** Artificially altering the markets in Pennsylvania as proposed in the Plan discourages investment, results in higher costs, and shifts risk to the public. (98)

Response: The Department notes that while it's not possible to establish detailed a cost-benefit analysis of each strategy in isolation, the Department recognizes that further analysis may be conducted prior to implementation that recognizes the suite of strategies selected.

159. **Comment:** The commentator recognizes the significant increase in efficiency and cost effectiveness in the solar industry, but further government intrusion into the solar market is questionable. (98)

Response: The Department thanks the commentator for the comment.

160. **Comment:** The commentator expressed concern that elements of the plan may ignore the potential increased cost to end users of electricity. (101)

Response: The Department notes that while it's not possible to establish detailed a cost-benefit analysis of each strategy in isolation, however, the modeling shows that achieving 10% in-state solar generation is both technically and economically feasible, with a small increase (<1.5%) to annual energy spending.

161. **Comment:** Dramatically increasing the PV carve out in the AEPS requirement could force solar to supplant more economical alternatives or renewable resources. (101)

Response: The Department recognizes that increasing SREC prices could have this effect. Any decision to implement a higher carve out presumes that reasonable efforts have been taken to ensure that consumers are receiving adequate value for those solar resources.

162. **Comment:** Carbon pricing would result in massive economic penalties for non-renewable sources and would result in higher end-use costs to consumers. (101)

Response: The Department recognizes that carbon pricing could impact the price paid on electricity bills, but the program design could include elements to reduce overall impacts to consumers. This includes direct uses of revenue to re-invest or offset taxes or other expenses and indirect savings such as avoiding lost productivity resulting from excess air pollution. It is presumed that these issues would be weighed and considered prior to implementation. Overall, modeling shows that achieving 10% in-state solar generation with these strategies is both technically and economically feasible, with a small increase (<1.5%) to annual energy spending.

163. **Comment:** The commentator is concerned that alternative ratemaking must ensure just and reasonable rates based on cost causation and that should take priority over avoiding disincentives for solar in the ratemaking process. (101)

Response: The Department recognizes this issue and acknowledges the pending outcome of a separate Public Utility Commission docket on implementation of Act 58 of 2018.

164. **Comment:** The commentator urges the Department to consider potential ratepayer impact wherever the draft Solar Future Plan has not included such information. (101)

Response: The Department agrees that ratepayer impact is an important consideration prior to implementation of any strategy. Overall, modeling shows that achieving 10% in-state solar generation is both technically and economically feasible, with a small increase (<1.5%) to annual energy spending.

165. **Comment:** The commentator states that the analysis of feasibility in the plan is incomplete with respect to its treatment of customer costs. (104, 107)

Response: The Department appreciates the comment.

166. **Comment:** The commentator states that the plan minimizes costs the utilities pay to maintain reliability, resiliency, and security. (104)

Response: Section 3.E of Appendix B of the Solar Future Plan covers the costs to the utilities in greater detail. The Department recognizes that implementation decisions could impact utility costs but expects those issues will be addressed prior to any implementation.

167. **Comment:** The commentator supports balanced policies that avoid price controls on energy sources, allow the market place to select the most appropriate sources, and reduce regulatory and other hurdles to the utilization of those sources, but believes the report significantly understates the transmission and distribution costs needed to accommodate 11GW of new solar. (112)

Response: The Department appreciates the comment and recognizes that additional analysis on cost issues including transmission and distribution costs would be helpful. From the perspective of this plan, some portion of additional solar will result in upgrades to enable interconnection. An additional, and potentially significant, portion of the upgrades to transmission and some portion of the distribution systems upgrades are likely to be driven by general upgrades over time with a recognition that other generation assets in differing locations will also be contributing significantly to the need of supporting updates and upgrades to the system.

168. **Comment:** The commentator states that the impact on customer utility bills resulting from an increase in the AEPS of less than \$2.00 per month is inaccurate and misleading. (113)

Response: The Department reexamined the bill impact as a result of AEPS and notes that the \$2.00 per month includes non-AEPS charges. The AEPS portion, based on an SREC of \$58, would be closer to \$0.68 per month.

169. **Comment:** The commentator states that increasing net metering would increase costs on non-net metered customers and result in cross-subsidization. (113)

Response: The Department recognizes the potential for cost shifting, and presumes that any implementation of expanded net metering would occur after further analysis of the value of additional solar generation to all customers. The Department also notes that cross-subsidization issues may be addressed through alternative ratemaking.

170. **Comment:** The commentator notes that the plan states a simple payback for customer sited power of 10 years or less while table 12 indicates a 11.3-year payback along with optimistic contract terms. (113)

Response: The Department notes that the 11.3-year payback in table 12 assumes no SREC. That table also shows a 9.8-year payment with a \$30/MWh SREC.

171. **Comment:** The commentator states that EDCs are reluctant to pursue on-bill financing because cost incurred will need to be recovered from non-solar customers, and that the utilities' primary focus is investment of capital into their distribution systems, not diverting capital into other projects. (113)

Response: The Department recognizes this concern and notes that during stakeholder meetings it has been stated that some view on-bill financing as a role that is not a core business function of EDCs.

172. **Comment:** The commentator states that the function of alternative ratemaking should be based on cost of service principals, and since reduction in customer usage does not reduce an EDCs' costs to provide distribution services in nearly all cases, such rates should move customers to a fixed charge or demand-based rate. (113)

Response: The Department thanks the commentator for the comment.

173. **Comment:** The commentator states that it is premature to definitively set a new AEPS target without a more detailed analysis of potential, cost impacts, and feasibility. (114)

Response: The Department recognizes this concern and notes that the strategies listed in the plan should not be considered recommendations for implementation as much as potential pathways to solar expansion. Additional analysis is encouraged on any such strategy prior to its implementation.

174. **Comment:** The commentator expresses concern that the financial modeling does not take into account possible ratepayer impacts. (114)

Response: The Department recognizes that individual ratepayer impacts were not provided separately for each strategy but notes that it's often not meaningful to consider strategies in isolation. Overall, modeling shows that achieving 10% in-state solar generation is technically and economically feasible, with a small increase (<1.5%) to annual energy spending.

175. **Comment:** The commentator expressed concern that that allowing utilities with regulated revenue streams to compete against competitive providers distorts the market. (115, 131)

Response: The Department thanks the commentator for the comment.

176. **Comment:** The commentator suggests that net metered customers should be compensated at the wholesale price of the electricity they generate, not the retail price. (115)

Response: The Department notes that determining the appropriate value of solar has been a topic of discussion among the stakeholders and in other states. While different methodologies are currently in use to set this value, they tend to reflect externalities and services far in excess of the wholesale price of electricity alone.

177. **Comment:** Expansion of AEPS and carbon pricing should be rejected because of the increased cost burden on Commonwealth residents and businesses. (118)

Response: The Department appreciates the comment.

178. **Comment:** The commentator urges the Department to be cautious expanding the role of EDCs, since increased EDC risk will require higher return on equity that will be recovered in distribution rates. (118)

Response: The Department is aware of this issue and agrees that caution is warranted before altering the role of EDCs.