

**EXH. WTE-9HC
DOCKET UE-20____
2020 PSE PCORC
WITNESS: WILLIAM T. EINSTEIN**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

Docket UE-20____

**EIGHTH EXHIBIT (HIGHLY CONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF**

WILLIAM T. EINSTEIN

ON BEHALF OF PUGET SOUND ENERGY

**REDACTED
VERSION**

DECEMBER 9, 2020

EMC – Introduction to Skookumchuck Wind



EMC Informational

November 17, 2016

Will Einstein
Customer Renewable Energy Programs

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HIGHLY CONFIDENTIAL PER WAC 480-07-160

Overview

- **Product Purpose:** Provide large customers with cost-effective products that help them meet their renewable energy goals
- **Risk Mitigation:** Helps manage risk that large customers choose other options to address their renewable energy needs.
- **Procure a new renewable energy resource in tandem with long-term commitments from the customers**
- **Identify all incremental costs associated with new resource**
- **Schedule 139 has strong support from the UTC**



Renewable Energy Resource Selection

- PSE issued RFI for small renewable energy projects on September 21, 2015
 - Included Wild Horse, Thorpe, and Goldendale sites for development
 - Other sites in PSE area were encouraged
 - 29 Responses received
 - Capacity Range: 1 MW – 19.7 MW
 - Price Range: (see Appendix)
- Other large renewable project options considered
 - PSE expand LSR
 - Wild Horse Expansion
 - EDF Kittitas:
 - Skookumchuck PPA (with RECs)

Takeaway: PSE analyzed numerous sites and offers. Skookumchuck was best fit for voluntary RE program.



Summary of Choices

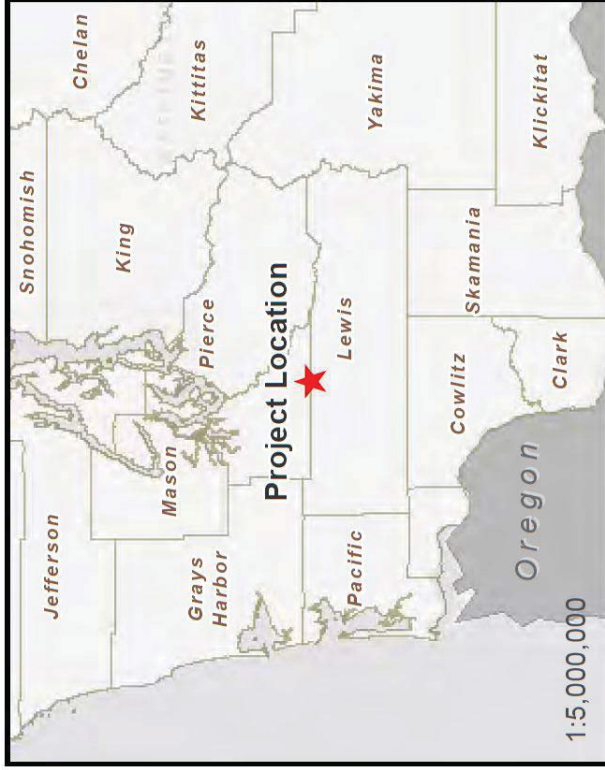
	Skook	LSR			Solar
Technology	Wind	Wind			PV
Levelized Cost per MWh	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Utility Scale (30 aMW min.)	Yes 140 MW	Yes 100 MW	Yes	Yes	No 18 MW
COD	12/2018	12/2020	12/2018	12/2018	12/2018
Transmission available or not needed	Yes	Yes	No	Yes	No
Rank	1st	2nd	3rd	Some customer interest	

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Skookumchuck Project

- ~130 MW wind project
- Located in Lewis and Thurston counties on ~20,000 acres of leased Weyerhaeuser property
- PSE Tono and Blumaer substations are <15 miles from project
- Siemens and Vestas turbines under consideration for project
- NCF estimates range from 31-33%
- Project is in WA SEPA permitting process and PSE interconnection process
- Estimated COD: December 2018



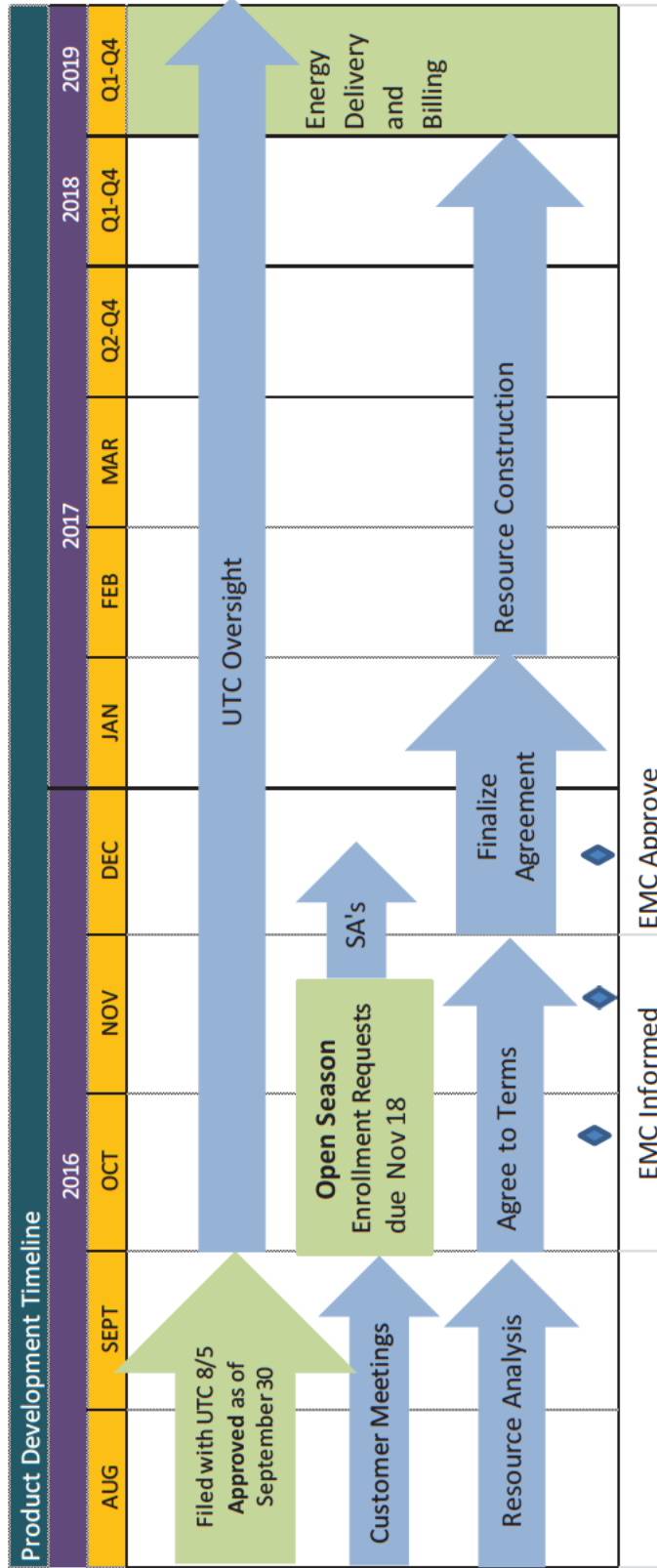
Customer Process Overview

- Customer outreach through Business Services and Government Relations teams
- Specific discussions with 8 commercial accounts, 11 cities, 5 public education institutions
- Held 1:1 meetings with green power team to build understanding of key program elements, costs & benefits.
- PSE provides template with all accounts listed including meters, addresses and 12 months usage. Customer selects yes/no and term 10/15/20 years.
- Enrollment Request (~LOI) due November 18, 2016.
- Assuming adequate product interest, customers will be asked to submit binding Service Agreement.
- PSE signs PPA to begin project development



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Next Steps



Risk of Under-Subscription

REDACTED VERSION

Skookumchuck	
130	MW
30%	Cap Fact
341,640	MWh/Yr
39.0	aMW
2019 PPA	
	\$/MWh
	\$/Year
	\$/aMW
2019 Market \$/MWh	
\$ 27.93	Mid-C
\$ 7.00	REC
\$ 34.93	Total
	Delta

aMW Subscribed	2019 Max Costs	Costs less Market
20	\$ 7,614,630	
25	\$ 5,610,780	
30	\$ 3,606,930	
35	\$ 1,603,080	
39	\$ -	

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EMC – Green Direct
Skookumchuck Wind Power
Purchase Agreement



EMC Decisional

December 16, 2016

Will Einstein, Michael Mullally

Recommendation

- PSE enter into a Power Purchase Agreement (PPA) with RES for the output from the Skookumchuck wind project
- PPA will be used to serve customers in Green Direct program (Schedule 139)
- PPA to be signed once more than 25 aMW (~62%) of customer commitments have been received through customer service agreements
- Skookumchuck Wind has a capacity of ~150 MW with expected capacity factors ranging from 30-33%; final capacity sized to customer demand



History

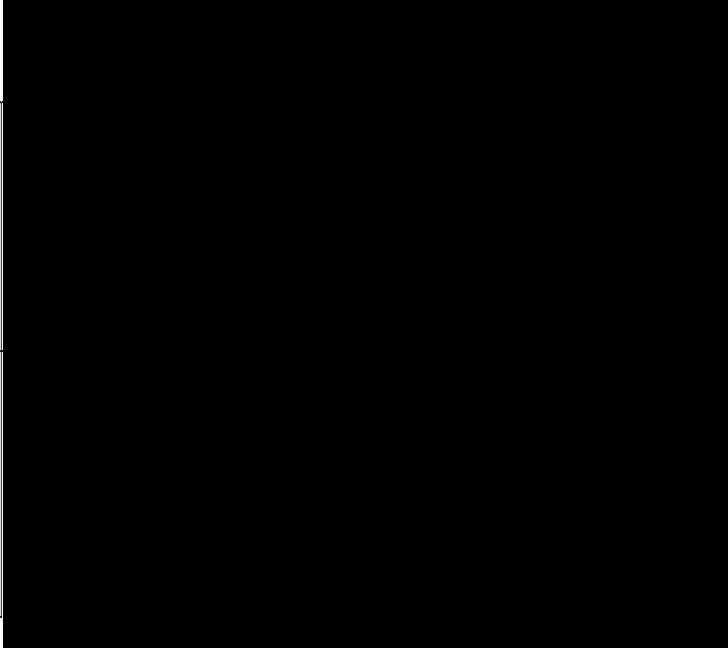
- PSE developed the goal of creating a new green power product for managed accounts and government customers such as cities, counties and colleges
- PSE talked to customers about their wants and identified key issues: new resource, fixed price, cost-competitive
- In parallel to customer discussions, PSE issued an RFI and negotiated with two viable wind projects
- The customer will make a long-term commitment of a minimum of 10 years
- Customer stays fully bundled with PSE and receives system power; however their bills reflect the cost of the new resource -- PPA, integration, etc. and the green attributes
- New charge includes a 2% annual escalator



Customer Interest

- PSE provided enrollment information (10/3/16) to 24 customers -- 8 commercial, 12 local governments, and 4 government institutions (total annual load of 75 aMW)
- Initial customer interest responses received on 11/18/16 totaled 40.5 aMW
- Another 9.7 aMW is interested, but could not complete initial application in time
- PSE requested binding Service Agreements from customers by December 14, 2016
 - Some customers will not make deadline due to lengthy internal approvals for binding commitment
 - To date, 6.6 aMW of customer agreements have been received from 3 customers
- Remaining expected over next 60 to 75 days

CUSTOMER TYPE	Initial Customer Commitment (aMW)
Commercial	



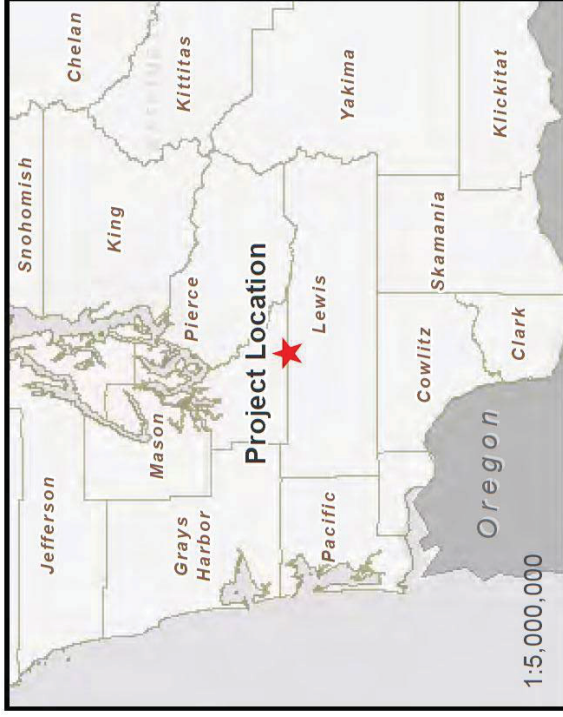
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REDACTED VERSION

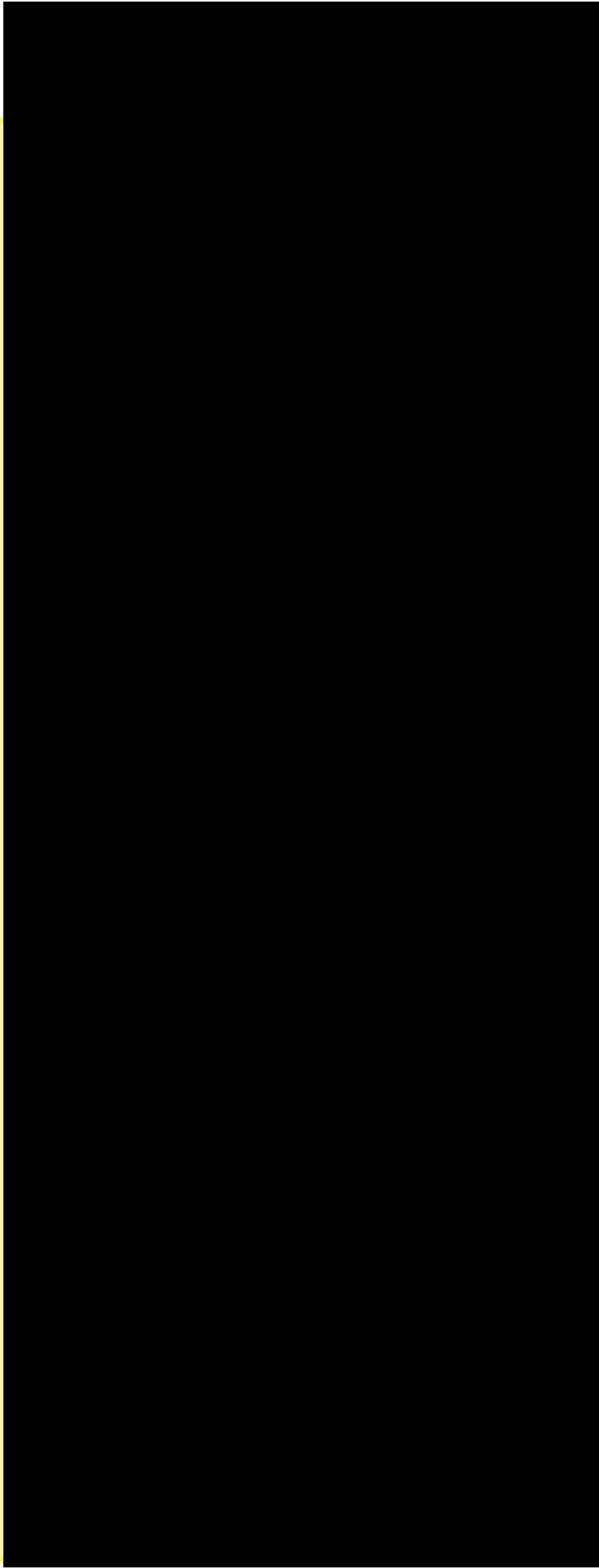
Skookumchuck Project

- ~150 MW wind project
- Located in Lewis and Thurston counties on ~20,000 acres of leased Weyerhaeuser property
- PSE Tono and Blumauer substations are <15 miles from project
- Siemens and Vestas turbines under consideration for project
- NCF estimates range from 30-33%
- Project is in WA SEPA permitting process and PSE interconnection process
- Estimated COD: December 2018



PPA Terms and Conditions

- RES America Developments Inc. is developer; Southern Power Company is likely owner / operator
- Turbine manufacturer dependent on total demand; Siemens, Vestas, and Gamesa all under consideration
- Approximately 130MW with PSE option to increase to approximately 152MW
- 20 year term, commencing by 12/31/18; optional five year extension, at PSE's discretion
-
-
-
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Recommendation

- PSE enter into a Power Purchase Agreement (PPA) with RES for the output from the Skookumchuck wind project
- PPA will be used to serve customers in Green Direct program (Schedule 139)
- PPA to be signed once more than 25 aMW (~62%) of customer commitments have been received through customer service agreements
- Skookumchuck Wind has a capacity of ~150 MW with expected capacity factors ranging from 30-33%; final capacity sized to customer demand



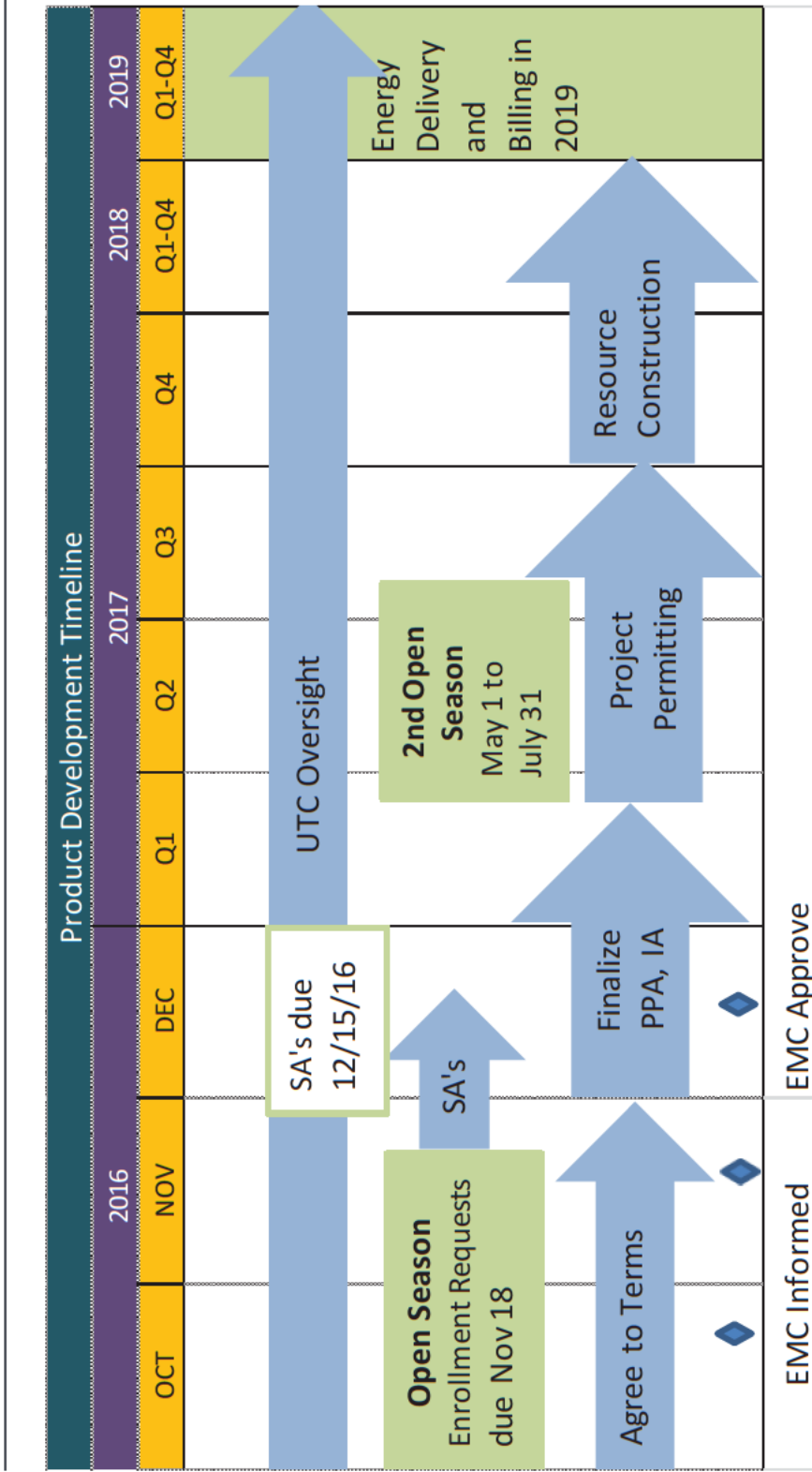
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APPENDIX



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Next Steps



2017 Green Direct RFP: Phase 1 results

Update to Energy Management Committee



Bob Williams
Sr. Energy Resource Planning & Acquisition Analyst

January 23, 2018

Background

- October 2017 EMC Update
 - Green Direct 1.0 sign-ups exceeded original projections
 - PSE released a Green Direct 2.0 RFP in August 2017 to meet WUTC filing requirement for Customer Open Season tariff start (May 1)
 - Phase 1 economic screening underway to identify most promising proposals for detailed quantitative and qualitative evaluation



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Phase 1 economic screening resulted in a list of candidate proposals for detailed qualitative review

- PSE selected 14 proposals (50 offers) for qualitative evaluation
- Selected offers had the lowest levelized costs (\$/MWh) for power delivered S, [REDACTED] between [REDACTED]
- Non-selected proposals had one or more of the following attributes:
 - higher price
 - higher energy delivery costs
 - respondent failed to provide minimum information required to screen proposals (e.g., no energy output, no price, etc.)

	Proposals Received	P1. Candidate Short List
Total proposals >5 MW	45	14
Total offers	140	50
Total capacity (MW)	5,101	1,289
Total solar proposals	26	9
Solar capacity (MW)	2,210	725
Total wind proposals	19	5
Wind capacity (MW)	2,891	564

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¹ The Renewable RFP was issued to help fill need for multiple voluntary green power programs, including solar programs.

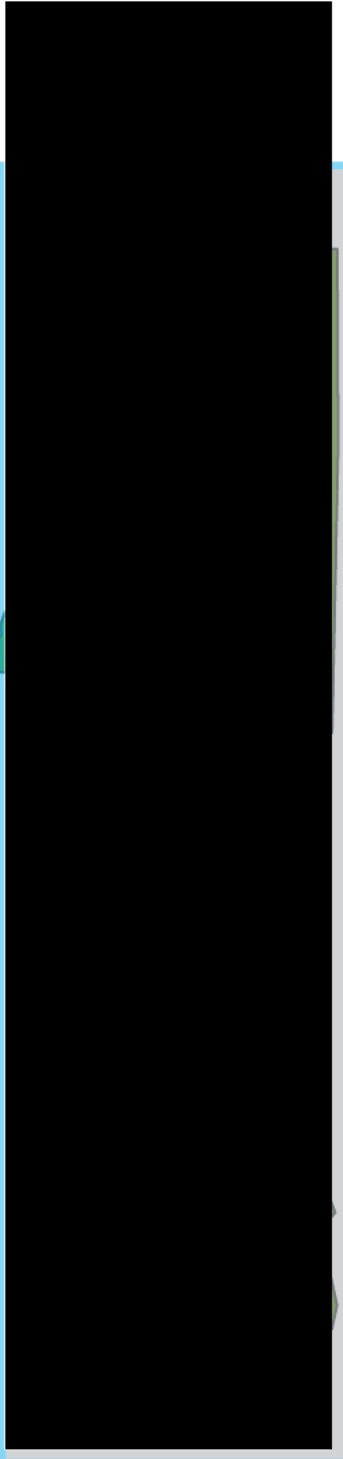
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Candidate short list includes 14 solar and wind proposals in Washington and Oregon

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ID	Project name	RFP counter art	State	COD	Selected structures	Max cap (MW)	Inter-connects to PSEI?	Best offer levelized cost \$/MWh	Best offer structure
17111									
17140									
17141									
17136									
17116									
17113									
17142									
17102									
17104									
17121									
17119									
17135									
17126									
17120									
17103									

[1] [2]



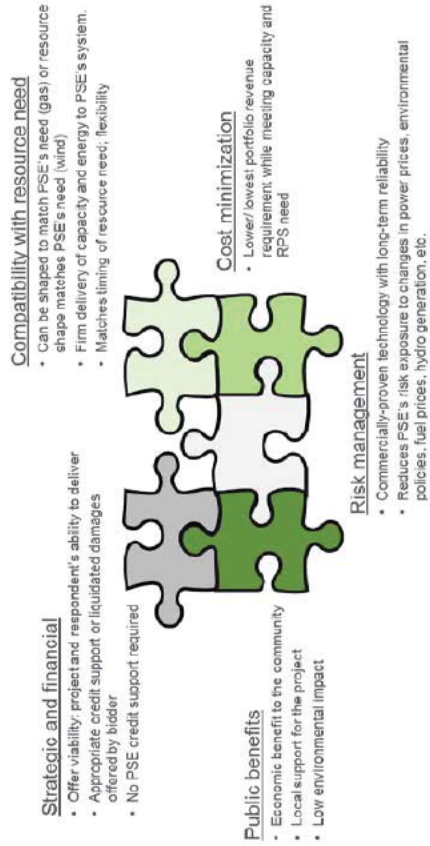
Maps are illustrative only.
Not to scale.



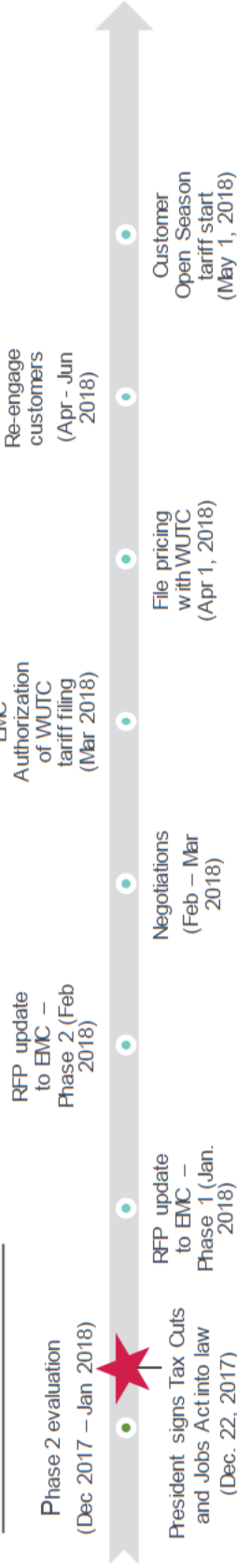
Final short list to be selected in Q1 2018

Phase 2: Due Diligence Evaluation

- Cross-functional team is currently evaluating proposals for qualitative fatal flaws, risks, merits and potential cost impacts
- Evaluation criteria helps identify proposals with lowest cost and least risk
- Quantitative team will update analysis based on qualitative review



Estimated schedule



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Evaluation team on track to recommend short list at February EMC meeting

- Preliminary qualitative review identified potential risks such as:
 - Early development with immature permitting, transmission and/or site control
 - Potentially high hurdles or delays related to permitting, land use, threatened or endangered species, cultural resources and/or community opposition
 - Transmission uncertainties: path/delivery point unclear, no request in queue, or uncertain availability or timing
 - Unrealistic project schedule
 - Potential impacts to proposed pricing due to recently passed tax reform law and Section 201 ITC trade case
- Team is reviewing data request responses from bidders to clarify risks and plans for mitigation; on track to recommend a short list in February



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Appendix

- Proposals received (>5MW)

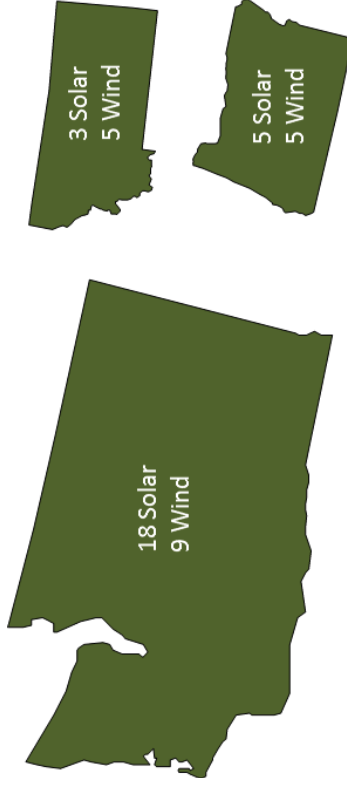
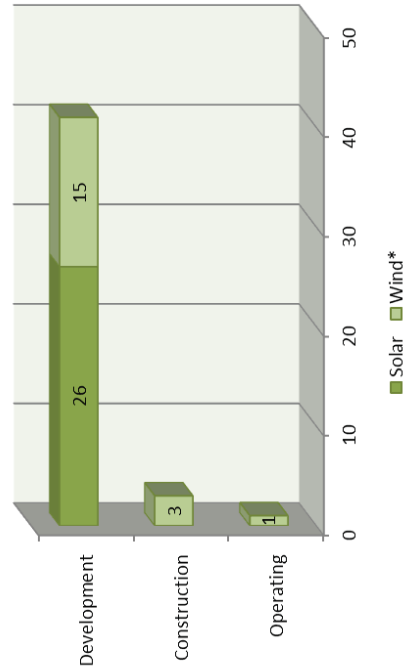


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PSE received 45 proposals aimed at meeting the needs of Green Direct 2.0¹

	Proposed structure			
	Proposals received	Capacity (MW)	Asset purchase	Proposal contained offers for both
Proposals >5 MW				
Solar proposals	26	2,210	2	8
Wind proposals*	19	2,891	4	5
Total proposals >5M	45	5,101	6	13

91% of the proposed projects are currently in the development stage



Almost two-thirds of the proposed projects are located in WA state



¹ PSE also received 19 proposals for resources 5 MW or less for the green power, solar choice and community solar programs. These offers are still being evaluated.

2017 Green Direct RFP: Phase 2 results

Update to Energy Management Committee



Bob Williams
Sr. Energy Resource Planning & Acquisition Analyst

Ryan Sherlock
Sr. Energy Resource Planning & Acquisition Analyst

March 22, 2018

Recommendation

The evaluation team recommends that the EMC approve selection of the Lund Hill Solar PPA for the purposes of negotiating a final price and terms for Green Direct 2.0.



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Green Direct 2.0 on track for Customer Open Season in Q2/Q3 2018

- ✓ August 2017: Green Direct 2.0 RFP released to meet additional product demand
- ✓ October 2017: Presented proposals received to EMC
- ✓ January 2018: Presented Phase 1 evaluation results to EMC
- ✓ February 2018: Presented Phase 2 evaluation results and short list to EMC
- ✓ Early March 2018:
 - ✓ Completed final peer review of Phase 2 results and revise corrections to [REDACTED] added 2% escalation) and (added flat pricing option) analyses (see Appendix)
 - ✓ Requested best and final pricing and PPA terms from bidders for top five proposals in “lightning round” final selection process
 - ✓ Selected Lund Hill Solar proposal, which offered the lowest levelized cost, delivery to PSE’s system and the most favorable overall risk profile

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REDACTED VERSION

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PSE requested best and final pricing and terms for top 5 proposals; selected Lund Hill Solar

ID	Project name	RFP counterparty	State	COD	Max cap (MW)	Inter-connects to PSE12	Best offer levelized cost (\$/MWh)	Best offer structure
17140								
17142								
17116								
17113								
17111								

REDACTED VERSION

- Lund Hill Solar offered lowest levelized cost per MWh and most favorable overall risk profile
- Experienced developer and owner of renewable resources in U.S., with considerable experience in Pacific Northwest
- Price includes delivery to BPAT.PSEI via Avangrid's existing BPA transmission rights
- Developer has 100% site control (1,000 acres on private land)
- Located in Klickitat County Overlay Zone; environmental review and permitting are expected to be expedited
- Project has significant local support

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Negotiations initiated with Avangrid for Lund Hill Solar PPA



Location: Klickitat County, Wash.
 Proposed COD: 12/31/2020
 Capacity (nameplate): 120 MW
 Net cap. factor: 27.52%

Projected average net output per year: 278,648 MWh¹

Structure/pricing options:

PPA Offer	Proposed PPA price, year 1 (\$/MWh) ²	Levelized cost (\$/MWh)	Estimated customer price, year 1 (\$/MWh) ³
<i>Preferred options</i>			
15-year, flat			
15-year, 2% escalating			
<i>Additional proposed options</i>			
20-year flat			
20-year, 2% escalating			

¹ Projected average net output does not include line losses, but does include degradation.
² PPA pricing and terms are subject to ongoing negotiations.
³ Customer price shown above is an estimated range that includes the proposed PPA price plus line losses, shaping costs, revenue taxes, capacity credit and administrative costs. Certain price components are still being determined.

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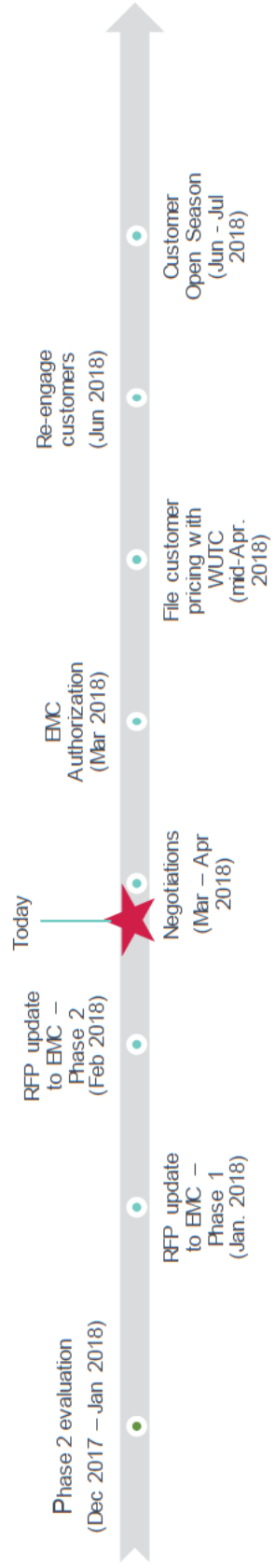
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Green Direct 2.0 Customer Open Season begins Q2/Q3 2018

Next steps

- Negotiate terms and execute PPA with Avangrid
- Site visit in early April
- Re-engage customers interested in Green Direct 2.0 subscription
- File pricing with WUTC

Schedule



Recommendation

The evaluation team recommends that the EMC approve selection of the Lund Hill Solar PPA for the purposes of negotiating a final price and terms for Green Direct 2.0.



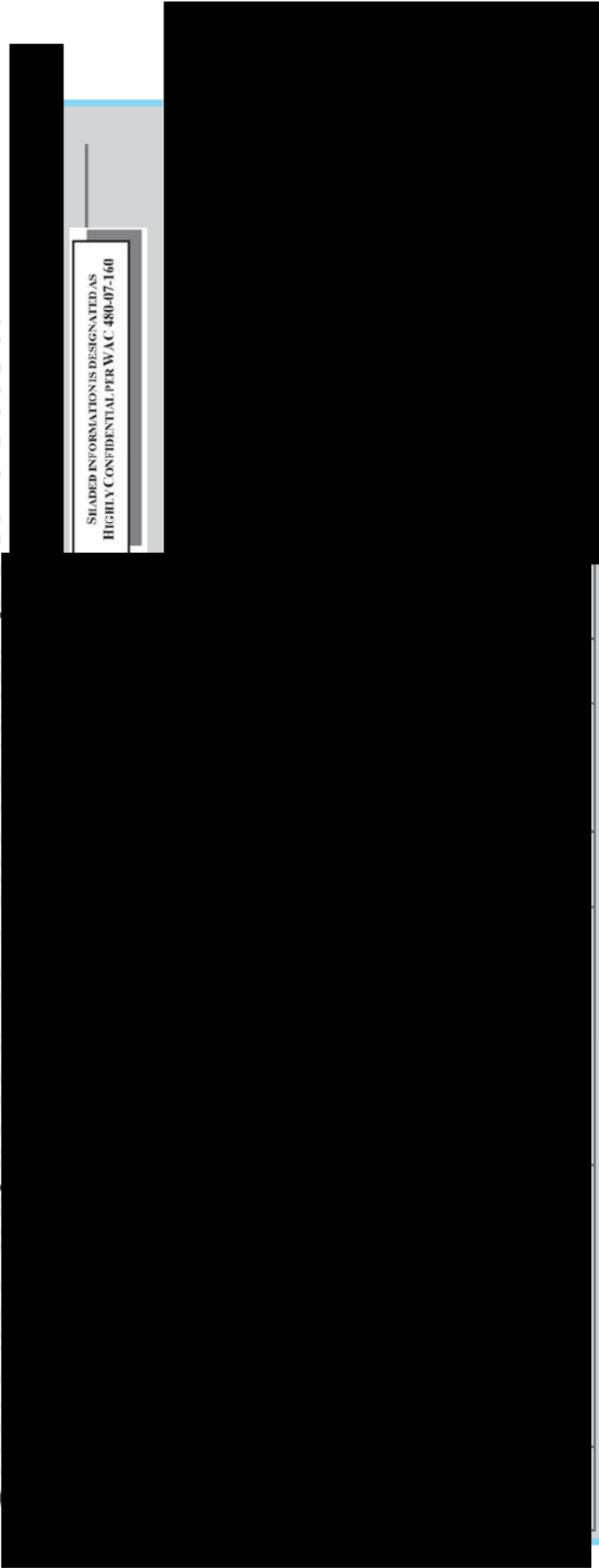
Appendix

- Phase 2 short list
- RFP Dashboard: Phase 2 results

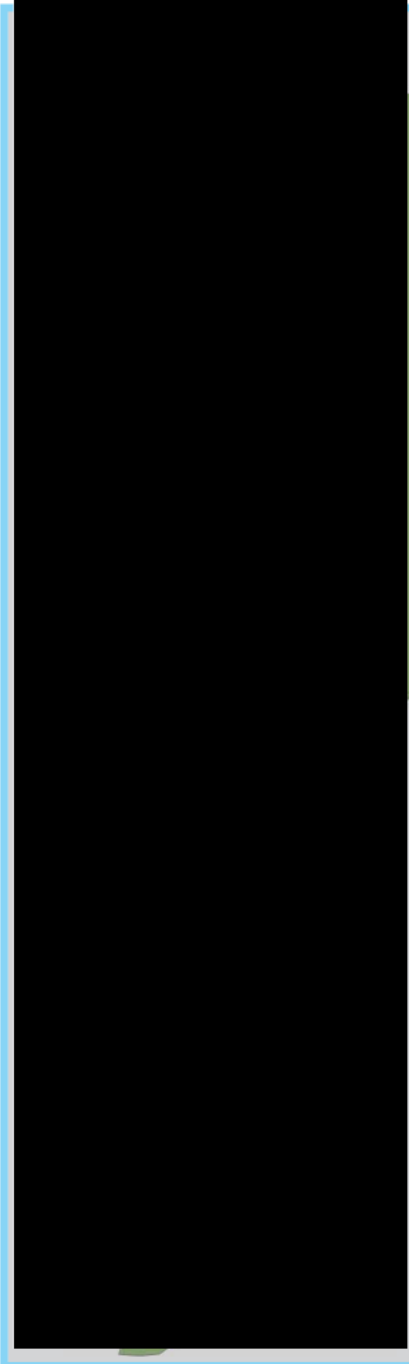


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Short list adjusted to reflect final peer review



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Phase 2 results: Eight proposals included offers with levelized costs under \$50/MWh

Proj. Code	Project Name / Counterparty	Location	Offer Cap (MW)	COD	Phase 2 Quantitative Summary			Phase 2 Qualitative Summary (Rankings represent best offer option)					Recommendation and Rationale				
					Best Offer Levelized Cost (\$/MWh)	Proposal Quant Rank* (of 44)	Best Offer Quant Rank** (of 48)	Best Offer Structure	Commercial	Transmission Interconnection*	Permitting	Community	Real Estate	Selection Status	Selection Rationale		
17140																	
17141																	
17136																	
17102																	
17116																	
17111																	
17142																	
17113																	



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Phase 2 results: Six proposals with levelized costs above \$50/MWh

Project	Phase 2 Quantitative Summary			Phase 2 Qualitative Summary (Rankings represent best offer option)				Recommendation and Rationale						
	Project Name / Counterparty	Location	Offer Cap (MW)	Best Offer Levelized Cost (\$/MWh)	Best Offer Quant Rank** (of 14)	Best Offer Quant Rank** (of 48)	Best Offer Structure	Commercial	Transmission/Interconnection	Permitting	Community	Real Estate	Selection Status	Selection Rationale
17104														
17126														
17119														
17121														
17135														
17103														
17120														

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Pricing Comparison

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2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029

Skookumchuck Pricing

10 Year Escalated	\$51.11	\$52.13	\$53.18	\$54.24	\$55.32	\$56.43	\$57.56	\$58.71	\$59.89	\$61.08
15 Year Escalated	\$50.63	\$51.64	\$52.68	\$53.73	\$54.80	\$55.90	\$57.02	\$58.16	\$59.32	\$60.51
20 Year Escalated	\$50.21	\$51.22	\$52.24	\$53.29	\$54.35	\$55.44	\$56.55	\$57.68	\$58.83	\$60.01
										\$61.21

Lund Hill Proposed Pricing

15 Year Escalated										
15 Year Flat										
20 Escalated										
20 Flat										

2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

Skookumchuck Pricing

10 Year Escalated	\$62.95	\$64.21	\$65.49	\$66.80						
15 Year Escalated	\$62.44	\$63.68	\$64.96	\$66.26	\$67.58	\$68.93	\$70.31	\$71.72	\$73.15	
20 Year Escalated										

Lund Hill Proposed Pricing

15 Year Escalated										
15 Year Flat										
20 Escalated										
20 Flat										



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Skookumchuck Rate Impact

	2019 Rate Adjustment		
	10 Year	15 Year	20 Year
Skookumchuck	\$51.11	\$50.63	\$50.21
Energy Charge Calculation	-\$47.13	-\$47.13	-\$47.13
Rate Impact	\$3.99	\$3.51	\$3.09



Green Direct Program: Customer Pricing & Regulatory Strategy

EMC Decisional



Ryan Sherlock
Sr. Energy Resource Planning & Acquisition Analyst

May 24, 2018

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Recommendation to approve the Green Direct blended pricing strategy

With Lund Hill Solar Project selected as lowest cost resource as presented to the EMC on March 24, 2018, requesting to create new blended portfolio pricing for Phase 1 and Phase 2 participants, combining the pricing from the Skookumchuck Wind Farm and the Lund Hill Solar Project.



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Green Direct on track for Customer Open Season in Q2/Q3 2018

- ✓ August 2017: Green Direct 2.0 RFP released to meet additional product demand
- ✓ October 2017: Presented proposals received to EMC
- ✓ January 2018: Presented Phase 1 evaluation results to EMC
- ✓ February 2018: Presented Phase 2 evaluation results and short list to EMC
- ✓ March 2018: Selected Lund Hill Solar proposal and conducted site visit.
- ✓ April 2018: Began engaging UTC staff regarding Phase 2 project selection and potential pricing strategies.



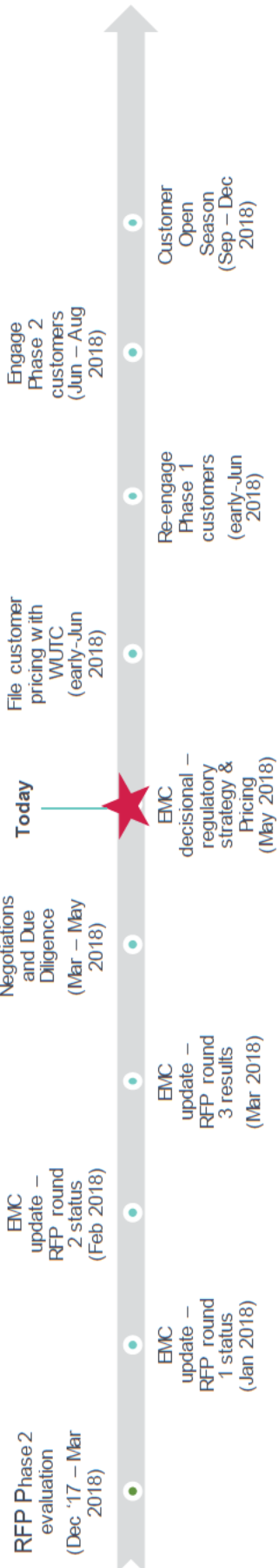
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Green Direct 2.0 Customer Open Season begins Q2/Q3 2018

Next steps

- Negotiate PPA terms and perform due diligence
- File pricing with WUTC
- Re-engage Phase 1 customers with updated pricing
- Engage Phase 2 customers interested in Green Direct subscription
- Execute PPA with Avangrid

Schedule



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Negotiations on going with Avangrid for Lund Hill Solar PPA

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Location: Klickitat County, Wash.

Proposed COD: 12/31/2020

Capacity (nameplate): 120 MWac

Net cap. factor: 27.52%

Projected average net output per year: 278,648 MWh¹



Structure/pricing options:

PPA Offer	Proposed PPA price, year 1 (\$/MWh) ²	Levelized cost (\$/MWh)	Estimated customer price, year 1 (\$/MWh) ³
<i>Original terms offered</i>			
15-year, flat			
15-year, 2% escalating			
20-year, flat			
20-year, 2% escalating			
<i>Additional terms requested</i>			
18-year, flat (indicative)			
18-year, 2% escalating (indicative)			

¹ Projected average net output does not include line losses, but does include degradation.

² PPA pricing and terms are subject to ongoing negotiations.

³ Customer price shown above is an estimated range that includes the proposed PPA price plus line losses, shaping costs, revenue taxes, capacity credit and administrative costs. Certain price components are still being determined.



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Blended pricing will offer the same rates to Phase 1 and Phase 2 customers

- Phase 1 customers will sign new contracts:
 - In 2019 and 2020 pricing will remain the same until Lund Hill reaches completion
 - In 2021 and beyond pricing will be lower and based on the blended rate
- Phase 2 customers will be offered the new blended rate:
 - Contracts will be offered starting in 2021 (upon completion of Lund Hill)
 - Customers will be offered terms of 10 Years, 15 Years, and 18 Years*

	2019	2020	2021
Original Phase 1 Pricing			
10 Year Customers	\$51.11	\$52.13	\$53.18
15 Year Customers	\$50.63	\$51.64	\$52.68
20 Year Customers	\$50.21	\$51.22	\$52.24
Proposed Blended Pricing (Phase 1)			
10 Year Customers	\$51.11	\$52.13	\$47.68
15 Year Customers	\$50.63	\$51.64	\$47.46
20 Year Customers	\$50.21	\$51.22	\$47.36
Proposed Blended Pricing (Phase 2)			
10 Year Customers			\$47.68
15 Year Customers			\$47.46
18 Year Customers*			\$47.36

* 18 Year term will be offered to Phase 2 customers in order to align end date with 20 Year term for Phase 1 customers.



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Recommendation to approve the Green Direct blended pricing strategy

With Lund Hill Solar Project selected as lowest cost resource as presented to the EMC on March 24, 2018, requesting to create new blended portfolio pricing for Phase 1 and Phase 2 participants, combining the pricing from the Skookumchuck Wind Farm and the Lund Hill Solar Project.



Appendix

- Pricing comparison: Green Direct 1.0 vs. Green Direct 2.0 (proposed)
- Green Direct 1.0: Skookumchuck PPA rate impact



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Pricing Comparison

Green Direct 2.0 proposed pricing vs. Green Direct 1.0 pricing

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Skookumchuck Pricing											
10 Year Escalated	\$51.11	\$52.13	\$53.18	\$54.24	\$55.32	\$56.43	\$57.56	\$58.71	\$59.89	\$61.08	
15 Year Escalated	\$50.63	\$51.64	\$52.68	\$53.73	\$54.80	\$55.90	\$57.02	\$58.16	\$59.32	\$60.51	\$61.72
20 Year Escalated	\$50.21	\$51.22	\$52.24	\$53.29	\$54.35	\$55.44	\$56.55	\$57.68	\$58.83	\$60.01	\$61.21

Lund Hill Proposed Pricing

- 15 Year Escalated
- 15 Year Flat
- 20 Escalated
- 20 Flat

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Skookumchuck Pricing											
10 Year Escalated	\$62.95	\$64.21	\$65.49	\$66.80							
15 Year Escalated	\$62.44	\$63.68	\$64.96	\$66.26	\$67.58	\$68.93	\$70.31	\$71.72	\$73.15		
20 Year Escalated											

Lund Hill Proposed Pricing

- 15 Year Escalated
- 15 Year Flat
- 20 Escalated
- 20 Flat

Lund Hill Proposed Pricing

- 15 Year Escalated
- 15 Year Flat
- 20 Escalated
- 20 Flat



Skookumchuck rate impact

	2019 Rate Adjustment		
	10 Year	15 Year	20 Year
Skookumchuck	\$51.11	\$50.63	\$50.21
Energy Charge Calculation	-\$47.13	-\$47.13	-\$47.13
Rate Impact	\$3.99	\$3.51	\$3.09



Green Direct Program: Customer Demand & Regulatory Strategy

EMC Decisional



Heather Mulligan
Manager Customer Renewable Energy Programs

Ryan Sherlock
Sr. Energy Resource Acquisition Analyst – Commercial Acquisitions Lead

September 20, 2018

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Recommendation to approve limited expansion of the Green Direct Program

With the Green Direct Program fully subscribed at 75 aMW and several customers awaiting entry, **the recommendation is to file a request with the UTC for a limited expansion of the existing Green Direct Program, from 75 aMW to 88 aMW, and to execute the Lund Hill PPA for the expanded capacity of 150 MW.**



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Enrollment for Green Direct Phase 2 launched at the end of August 2018

- ✓ August 2017: Green Direct 2.0 RFP released to meet additional product demand
- ✓ February 2018: Presented Phase 2 evaluation results and short list to EMC
- ✓ March 2018: Selected Lund Hill Solar proposal for 120MW with option for 150MW
- ✓ May 2018: EMC approved regulatory strategy & pricing
- ✓ July 2018: UTC approval of Phase 2 options and blended pricing
- ✓ August 2018: Open Enrollment began for Phase 2



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Phase 2 customer interest exceeds current program allotment by 8 aMW

Order Received	Customer	Request (aMW)
[REDACTED]		

Green Direct Phase 2

Customer Demand	40 aMW
Program Capacity	32 aMW
Unmet Customer Demand	8 aMW

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Avangrid's Lund Hill Solar Project can be expanded to satisfy customer demand

Project Name: Lund Hill Solar
 PPA Partner: Avangrid Renewables
 Location: Klickitat County, Wash.
 Proposed COD: 12/31/2020
 Term: 20 years
 Delivered to: PSE's System



PPA Summary	120 MW Solar Facility	150 MW Solar Facility
Nameplate Capacity	120.0 MW	150.0 MW
Net Capacity Factor (NCF)*	27.52%	27.57%
Guaranteed Annual Output*	32 aMW	42 aMW
Annual Energy*	288,532 MWh	362,208 MWh

* NCF, Annual aMW and MWh are represented in the final year of the program (2038)



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Blended pricing will remain close to that already agreed upon by the UTC

- The blended pricing strategy for Phase 1 and Phase 2 customers was approved by the UTC in July, 2018
- Phase 2 customers interest was based on blended pricing as approved by the UTC
- Additional 30 MWs of solar has little effect on overall customer pricing
- Blended pricing will remain close to that already proposed, or be unchanged, for all Green Direct participants

	2019	2020	2021
<i>Blended Pricing (Phase 1 and 2)</i>			
10 Year Customers	\$51.11	\$52.13	\$46.75
15 Year Customers	\$50.63	\$51.64	\$46.50
20 Year Customers	\$50.21	\$51.22	\$46.39



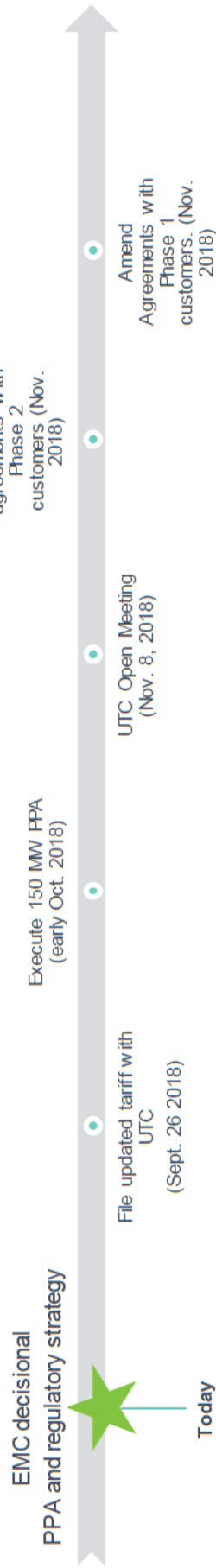
* 18 Year term will be offered to Phase 2 customers in order to align end date with 20 Year term for Phase 1 customers.

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PSE will request a limited program expansion from the UTC

- File tariff with UTC including updated blended pricing as needed (~ week of 9/24)
- Execute 150 MW PPA with Avangrid Renewables
- Finalize agreements with full Phase 2 customer list
- Amend agreements with Phase 1 customers

Schedule



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Recommendation to approve limited expansion of the Green Direct Program

With the Green Direct Program fully subscribed at 75 aMW and several customers awaiting entry, **the recommendation is to file a request with the UTC for a limited expansion of the existing Green Direct Program, from 75 aMW to 88 aMW, and to execute the Lund Hill PPA for the expanded capacity of 150 MW.**



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Appendix

- Full Blended Rate Schedules



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Full Blended Rate Schedules (proposed)

Green Direct 2.0 proposed pricing vs. Green Direct 1.0 pricing

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Blended - Phase 1	1	2	3	4	5	6	7	8	9	10
10 Year ¹	\$51.11	\$52.13	\$46.75	\$47.69	\$48.64	\$49.61	\$50.60	\$51.62	\$52.65	\$53.70
15 Year ¹	\$50.63	\$51.64	\$46.50	\$47.43	\$48.38	\$49.35	\$50.34	\$51.34	\$52.37	\$53.42
20 Year ¹	\$50.21	\$51.22	\$46.39	\$47.31	\$48.26	\$49.23	\$50.21	\$51.21	\$52.24	\$53.28
Blended - Phase 2	1	2	3	4	5	6	7	8		
10 Year ²	\$46.75	\$47.69	\$48.64	\$49.61	\$50.60	\$51.62	\$52.65	\$53.70		
15 Year ²	\$46.50	\$47.43	\$48.38	\$49.35	\$50.34	\$51.34	\$52.37	\$53.42		
18 Year ²	\$46.39	\$47.31	\$48.26	\$49.23	\$50.21	\$51.21	\$52.24	\$53.28		
	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Blended - Phase 1	11	12	13	14	15	16	17	18	19	20
10 Year ¹	\$54.49	\$55.57	\$56.69	\$57.82	\$58.98					
15 Year ¹	\$54.35	\$55.44	\$56.54	\$57.68	\$58.83	\$60.01	\$61.21	\$62.43	\$63.68	\$64.95
20 Year ¹										
Blended - Phase 2	9	10	11	12	13	14	15	16	17	18
10 Year ²	\$54.78	\$55.87								
15 Year ²	\$54.49	\$55.57	\$56.69	\$57.82	\$58.98	\$60.16	\$61.36			
18 Year ²	\$54.35	\$55.44	\$56.54	\$57.68	\$58.83	\$60.01	\$61.21	\$62.43	\$63.68	\$64.95

¹ Only available for meters located at service address already under contract for Renewable Energy and enrolled under this tariff schedule from the previous Open Season.

² Not available for meters located at service address already under contract for Renewable Energy and enrolled under this tariff schedule from the previous Open Season.



Green Direct Program: Lund Hill PPA Amendment



EMC Decisional

November 21, 2019

Heather Mulligan

Manager, Customer Renewable Energy Program

Ryan Sherlock

Product Development Manager

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Recommendation to approve the proposed Lund Hill PPA Amendment

In order to align with Clean Energy Transformation Act (CETA) labor provisions and accommodate customer interest in maximizing labor participation in construction of the Lund Hill Solar Farm, **the recommendation is to approve an amendment to the Lund Hill Solar PPA.**



Green Direct Phase 2 – Timeline & Approvals

- ✓ **August 2017:** Green Direct 2.0 RFP released to meet additional product demand
- ✓ **February 2018:** Presented Phase 2 evaluation results and short list to EMC
- ✓ **March 2018:** Selected Lund Hill Solar proposal for 120MW with option for 150MW
- ✓ **May 2018:** EMC approved regulatory strategy & pricing
- ✓ **July 2018:** UTC approval of Phase 2 options and blended pricing
- ✓ **August 2018:** Open Enrollment for Phase 2 -- customer interest outstripped program size of 75 aMW
- ✓ **October 2018:** UTC approval of Green Direct expansion by 10 aMW to 85 aMW
- November 2018:** Lund Hill PPA Executed with Avangrid Renewables at 150MW to accommodate program expansion
- ✓ **May 2019:** Clean Energy Transformation Act (CETA) signed by Governor Inslee



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Avangrid's Lund Hill Solar PPA can be amended to meet customer preference with little impact

Project Name: Lund Hill Solar
 PPA Partner: Avangrid Renewables
 Location: Klickitat County, Wash.
 Nameplate Size (Annual*): 150MW (42 aMW*)
 Net Capacity Factor*: 27.57%
 Annual Energy*: 362,208 MWh
 Term: 20-years
 Delivered to: PSE's System (BPAT.PSEI)



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PPA Summary	Current PPA	Amended PPA
Supply Start Date	12/31/2020	3/1/2021
Commercial Operation Date (COD)	12/31/2020	7/31/2021
Construction Labor Terms	No Labor terms	Project Labor Agreement (PLA)
PPA Price (Y1)		

* NCF, Annual aMW and MWh are represented in the final year of the program (2038)

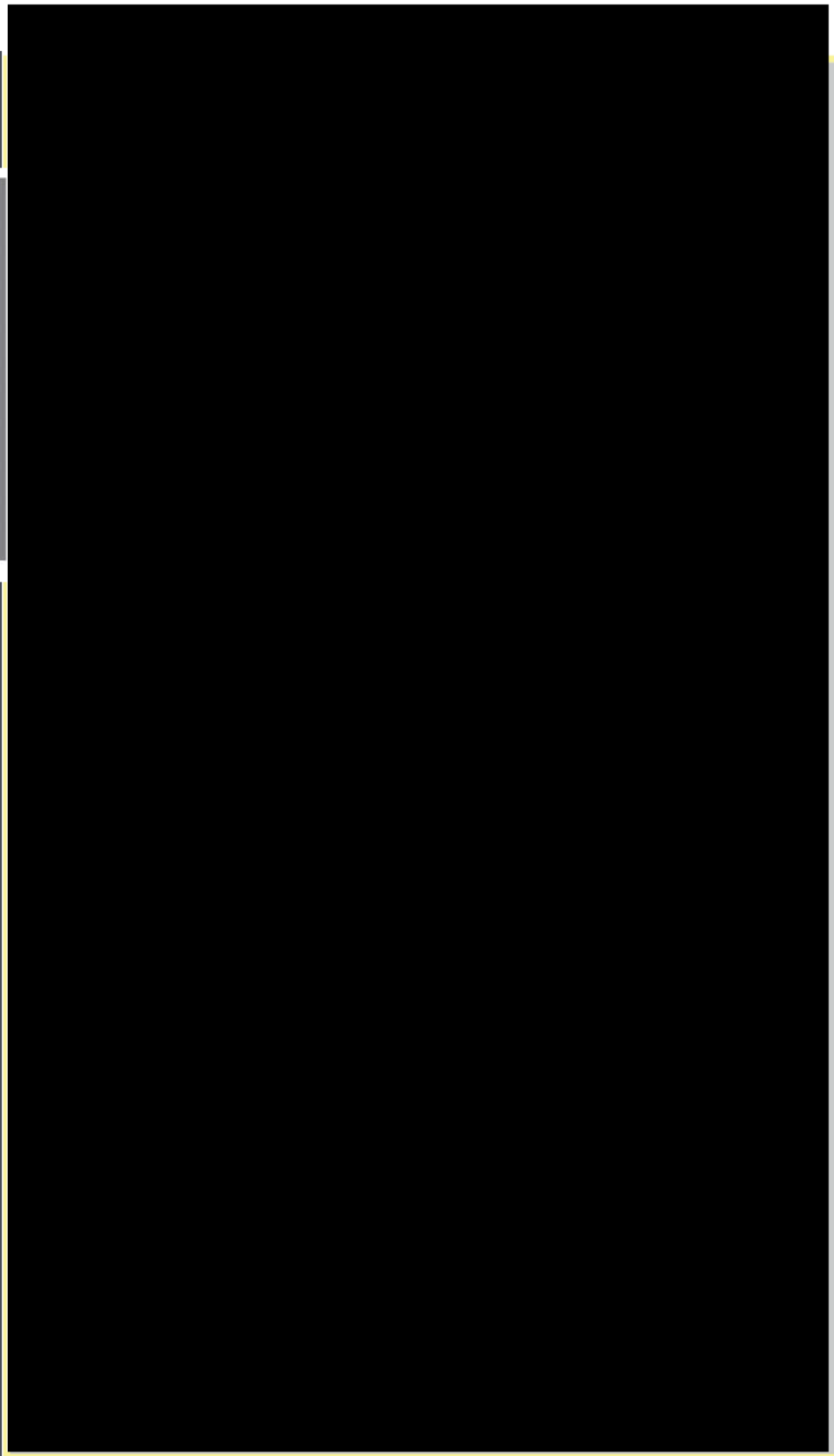


November 21, 2019 - EMC Decisional: Lund Hill PPA Amendment

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Lund Hill PPA amendment is being finalized with the following general structure

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Benefits of Amended PPA

- Interim solution that meets customer needs for energy and RECs & addresses project COD delay
- No price increase to Lund Hill PPA
- No impact to Green Direct program pricing
- Alignment with labor provisions in CETA



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Recommendation to approve the proposed Lund Hill PPA Amendment

In order to align with Clean Energy Transformation Act (CETA) labor provisions and accommodate customer interest in maximizing labor participation in construction of the Lund Hill Solar Farm, **the recommendation is to approve an amendment to the Lund Hill Solar PPA.**



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Appendix

- Green Direct customer overview



