Solar Connections Update

Your Trusted Energy Partner

Commission Presentation – September 12, 2017

Solar Connections
BENTON PUD

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Reliable Public Power Provider

Agenda

- Federal Incentives/Subsidies
- State Incentives/Subsidies
- Program History
- Senate Bill 5939
- Impacts
- Next Steps

Federal Incentives/Subsidies

Investment Tax Credit (ITC)

In-Service Date	End of 2017	End of 2018	End of 2019	End of 2020	End of 2021	End of 2022	Beyond
PV, Solar Water Heating, Solar Space Heating/Cooling, Solar Process Heat	30%	30%	30%	26%	22%	10%	10%
Hybrid Solar Lighting, Fuel Cells, Small Wind	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Geothermal Heat Pumps, Microtubines, Combine Heat and Power Systems	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Geothermal Electric	10%	10%	10%	10%	10%	10%	10%
Large Wind (over 100 kW)	24%	18%	12%	N/A	N/A	N/A	N/A

***Source**: https://energy.gov/savings/business-energy-investment-tax-credit-itc*

Production Tax Credit (PTC)[1]

In-Service Date	End of 2016	End of 2017	End of 2018	End of 2019	End of 2020
Wind	$23.00/MWh	$18.40/MWh	$14.72/MWh	$11.04/MWh	$7.36/MWh
Geothermal, Closed-loop Biomass & Solar	$23.00/MWh	N/A	N/A	N/A	N/A
Other Technologies	$12.00/MWh	N/A	N/A	N/A	N/A

***Source**: https://energy.gov/savings/renewable-electricity-production-tax-credit-ptc*

1- Technologies that are eligible for the PTC were eligible to opt for the ITC instead if construction commenced prior to January 1, 2015. As of January 1, 2015, only wind energy systems are eligible to claim the ITC instead of the PTC.

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*** Information listed based on staff's current interpretation and understanding. Subject to change.*

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State Incentives/Subsidies

Customer-generated power applicable rates	Base rate (0.15) multiplied by applicable factor, equals incentive payment rate
Solar modules manufactured in Washington **Factor: 2.4** (two and four-tenths)	$0.36
Stirling converter manufactured in Washington **Factor: 2.4** (two and four-tenths)	$0.36
Solar or wind generating equipment with an inverter manufactured in Washington **Factor: 1.2** (one and two-tenths)	$0.18
Both solar modules and inverter manufactured in Washington **Factor: (2.4 + 1.2) = 3.6**	$0.54
Anaerobic digester or oth or wind generator equipp manufactured in Washin **Factor: 1.0** (one)	
Wind generator equippe and inverter manufacture **Factor: (1.0 + 1.2) = 2.2**	
All other electricity produ **Factor: 0.8** (eight-tenths	

Customer-generated power applicable rates	Base rate (0.30) multiplied by applicable factor, equals incentive payment rate
Solar modules manufactured in Washington **Factor: 2.4** (two and four-tenths)	$0.72
Stirling converter manufactured in Washington **Factor: 2.4** (two and four-tenths)	$0.72
Solar inverter manufactured in Washington **Factor: 1.2** (one and two-tenths)	$0.36
Both solar modules and inverters manufactured in Washington	$1.08
	$0.30

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RCWs > Title 80 > Chapter 80.60

Chapter 80.60 RCW

NET METERING OF ELECTRICITY

Complete Chapter

Sections

80.60.005 Findings.
80.60.010 Definitions.
80.60.020 Available on first-come, first-served basis—Interconnected metering systems allowed—Charges to customer-generator.
80.60.030 Net energy measurement—Required calculation—Unused credit—Meter aggregation.
80.60.040 Safety, power quality, and interconnection requirements—Customer-generator's expense—Commission may adopt additional requirements.

Net Metering of Electricity

	Capacity (kW)
Cap (0.5% 1996 Peak)	1,890
Current Installations	1,201
Excess	689

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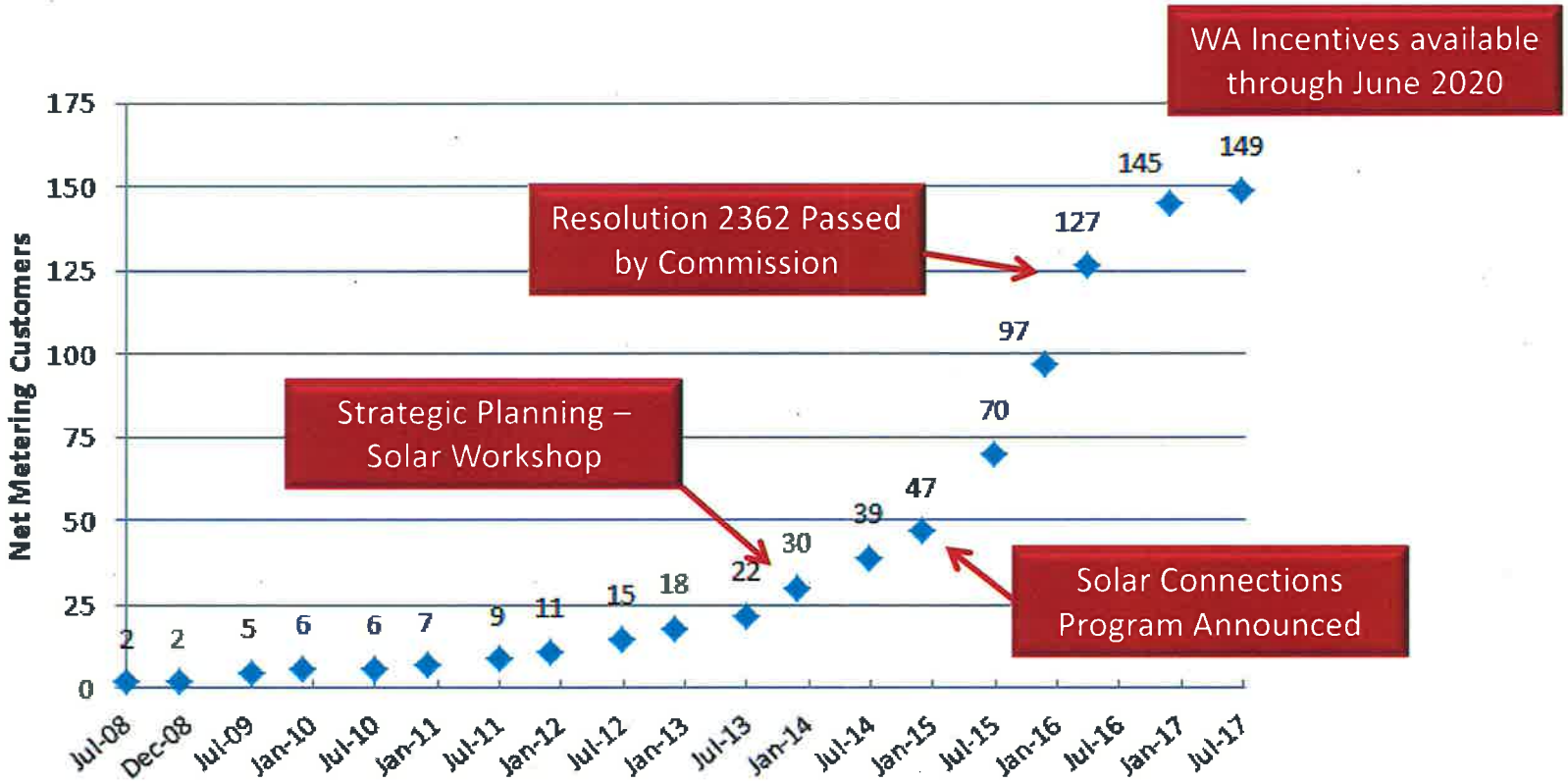
Program History



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Program History

Project/Program	Customers	Actuals 2017	Estimated Incentives 2018**	Estimated Incentives 2019**
Ely	112	$ 112,084	$ 121,000	$ 121,000
O.I.E.[1]	42	$ 37,177	$ 37,177	$ 37,177
Net Metering - Core[2]	128	$ 451,291	$ 455,804	$ 455,804
Total Core Participants	**282**	**$ 600,552**	**$ 613,981**	**$ 613,981**
REIP Cap		$ 642,538	$ 658,602	$ 675,067
Remaining REIP Cap		**$ 41,987**	**$ (44,621)**	**$ (61,086)**
Net Metering - Conditional[3]	21	$ 45,437	$ 70,272	$ 95,106
(Over)/Under Cap		**$ (3,451)**	**$ 25,651**	**$ 34,020**

1 - O.I.E. Project's first full year of operation.

2 - Net Metering Customers under contract before cutoff establish by Resolution 2362

3 - Net Metering Customers under contract and installed after cutoff establish by Resolution 2362

***Assumes max output observed from both Ely and OIE Projects;*
Assumes 5 Net Metering - Conditional customers added in outyears at $0.54/kWh, 7 kW system and 15% capacity factor

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Senate Bill 5939

CERTIFICATION OF ENROLLMENT

ENGROSSED SUBSTITUTE SENATE BILL 5939

Chapter 36, Laws of 2017

65th Legislature
2017 3rd Special Session

RENEWABLE ENERGY--TAX INCENTIVES--FEES

EFFECTIVE DATE: July 7, 2017

Passed by the Senate June 30, 2017
Yeas 47 Nays 2

CYRUS HABIB
President of the Senate

Passed by the House June 30, 2017
Yeas 74 Nays 19

FRANK CHOPP
Speaker of the House of Representatives

Approved July 7, 2017 1:50 PM

JAY INSLEE
Governor of the State of Washington

CERTIFICATE

I, Hunter G. Goodman, Secretary of the Senate of the State of Washington, do hereby certify that the attached is **ENGROSSED SUBSTITUTE SENATE BILL 5939** as passed by Senate and the House of Representatives on the dates hereon set forth.

HUNTER G. GOODMAN
Secretary

FILED

July 7, 2017

Secretary of State
State of Washington

Changes Implemented:

- System Sizes
  - Residential Scale – Up to 12kW
    - $5K annually household/entity
  - Commercial Scale – 12kW to 1MW
    - $25K annually per household/entity
  - Community Solar – Up to 1MW
    - $5K annually per household/entity
  - Shared Commercial – 1MW to 5MW
    - $35K annually per household/entity
- Incentive Rates

Fiscal Year of System Certfication	Base Rate - Residential Scale	Base Rate - Commercial Scale	Base Rate - Community Solar	Base Rate - Shared Commercial Solar	Made In WA Bonus
2018	$ 0.16	$ 0.06	$ 0.16	$ 0.06	$ 0.05
2019	$ 0.14	$ 0.04	$ 0.14	$ 0.04	$ 0.04
2020	$ 0.12	$ 0.02	$ 0.12	$ 0.02	$ 0.03
2021	$ 0.10	$ 0.02	$ 0.10	$ 0.02	$ 0.02

- Utility Incentive Caps
  - *0.50% to 1.50%*

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Impacts on Incentive Program

WA State Economics of Solar

System Size (kW): 12 | Installed in: 2018

	30% ITC WA Made	30% ITC Non-WA Made	30% ITC No Incentives
Installation Cost ($2.70/watt)			
System Cost	$ 32,400	$ 32,400	$ 32,400
Federal Tax Credit	$ (9,720)	$ (9,720)	$ (9,720)
Total Cost to Install	**$ 22,680**	**$ 22,680**	**$ 22,680**
Net Metering Yearly Energy Savings			
kWh per Year[1]	15,768	15,768	15,768
Electricity Rate[2]	$ 0.0718	$ 0.0718	$ 0.0718
Total Annual Benefit	$ 1,132.14	$ 1,132.14	$ 1,132.14
WA State Incentives			
kWh per Year[1]	15,768	15,768	15,768
Incentive Rate	$ 0.21	$ 0.16	$ -
Annual Incentive	$ 3,311.28	$ 2,522.88	$ -
Total Incentive[3]	$ 16,200.00	$ 16,200.00	$ -
Payback Period (Years)	**5.1**	**6.2**	**20.0**

ITC = Investment Tax Credit

1 - WA uses 15% Capacity Factor; CA assumes 18% Capacity Factor
2 - Assumes District's Residential Rate
3 - Receive Incentive for 8 years unless 50% of total project cost reached.

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Impacts on Incentive Program

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O.I.E.[1]	42	$ 37,177	$ 37,177	$ 37,177
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Total Core Participants	**282**	**$ 600,552**	**$ 613,981**	**$ 613,981**
New REIP Cap - SB 5939		$ 1,801,098	$ 1,801,098	$ 1,801,098
Remaining REIP Cap		**$ 1,200,546**	**$ 1,187,117**	**$ 1,187,117**
Net Metering - Conditional[3]	21	$ 45,437	$ 70,272	$ 95,106
(Over)/Under Cap		**$ 1,155,109**	**$ 1,116,846**	**$ 1,092,011**

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***Assumes max output observed from both Ely and OIE Projects;*
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Next Steps

- Adopt Resolution 2423
- Update Website
- Notify Contractors
- Update Documentation
- Revise Marketing Materials
- Educate/Promote

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Thank you!

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Credit Exposure: Public Utility District No. 1 of Benton County, Washington

Counterparty	Agreement Type	Credit Limit	Credit Available	Percent Available	Credit Adj	Collateral	Receivable Balance	Unbilled Rec/ Pay	Fwd Physicals	Fwd Financials	Credit Exposure	S&P Rating
American Electric Power Service Corporation		$2,250,000	$2,250,000			$0						BBB
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Arizona Public Service Company		$1,912,500	$1,912,500			$0						A-
	WSPP	-	$1,912,500	100.00%	-	$0	-	-	$0	-	-	
Avangrid Renewables, LLC			$100,000			$100,000						
	ISDA w/ Pwr Anx	-	$100,000	100.00%	-	$0	-	-	$0	-	-	
	TRNC	-	$100,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$100,000	100.00%	-	$0	-	-	$0	-	-	
Avista Corporation		$1,162,500	$1,162,500			$0						BBB
	TRNC	-	$1,162,500	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$1,162,500	100.00%	-	$0	-	-	$0	-	-	
BP Energy Company			$2,900,000			$2,900,000						
	ISDA	-	$2,900,000	100.00%	-	$0	$0	$0	$0	-$12,355	-$12,355	
	TRNC	-	$2,900,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,900,000	100.00%	-	$0	-	-	$0	-	-	
CP Energy Marketing (US) Inc.			$2,000,000			$2,000,000						
	WSPP	-	$2,000,000	100.00%	-	$0	-	-	$0	-	-	
Cargill Power Markets, LLC			$2,250,000			$2,250,000						
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Chelan County PUD No. 1		$2,250,000	$2,250,000			$0						AA
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	

Counterparty	Agreement Type	Credit Limit	Credit Available	Percent Available	Credit Adj	Collateral	Receivable Balance	Unbilled Rec/ Pay	Fwd Physicals	Fwd Financials	Credit Exposure	S&P Rating
Citigroup Energy Inc.			$1,965,904			$2,250,000						
	ISDA w/ Pwr Anx	-	$1,965,904	87.37%	-	$0	$0	$229,024	$0	$55,072	$284,096	
	TRNC	-	$1,965,904	87.37%	-	$0	-	-	$0	-	-	
	WSPP	-	$1,965,904	87.37%	-	$0	-	-	$0	-	-	
City of Seattle, by and through its City Light Dept		$2,250,000	$2,250,000			$0						AA
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Clatskanie People's Utility District		$1,031,250	$1,031,250			$0						BBB+
	TRNC	-	$1,031,250	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$1,031,250	100.00%	-	$0	-	-	$0	-	-	
EDF Trading North America, LLC			$0			$0						
	ISDA w/ Pwr Anx	-	$2,250,000	100.00%	-	$2,250,000	$0	-$239,690	$0	-$114,248	-$353,938	
Emerald People's Utility District		$2,250,000	$2,250,000			$0						NR
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	Transmission	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Eugene Water & Electric Board		$2,250,000	$2,250,000			$0						AA-
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Exelon Generation Company, LLC		$2,250,000	$2,250,000			$0						BBB
	ISDA	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
FortisBC Energy Inc.		$450,000	$450,000			$0						
	Gas EDI	-	$450,000	100.00%	-	$0	-	-	$0	-	-	
Grant County Public Utility District No. 2		$2,250,000	$2,250,000			$0						AA
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
IGI Resources, Inc.		$0	$100,000			$100,000						
	Gas	-	$100,000	0.00%	-	$0	-	-	$0	-	-	

Counterparty	Agreement Type	Credit Limit	Credit Available	Percent Available	Credit Adj	Collateral	Receivable Balance	Unbilled Rec/ Pay	Fwd Physicals	Fwd Financials	Credit Exposure	S&P Rating
Idaho Falls Power		$2,250,000	$2,250,000			$0						
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Idaho Power Company		$2,250,000	$2,250,000			$0						BBB
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
J. Aron & Company LLC			$2,250,000			$2,250,000						
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
JP Morgan Ventures Energy Corporation			$2,250,000			$2,250,000						
	ISDA	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
LL&P Wind Energy, Inc.		$500,000	$500,000			$0						
	Power	-	$500,000	100.00%	-	$0	-	-	$0	-	-	
Macquarie Energy, LLC			$0			$0						
	ISDA w/ Pwr Anx	-	$2,150,000	100.00%	-	$2,150,000	$30,470	-$51,802	$0	-$13,978	-$35,310	
Morgan Stanley Capital Group, Inc.			$2,196,065			$2,250,000						
	ISDA	-	$2,196,065	97.60%	-	$0	$64,078	-$4,197	$0	-$5,946	$53,935	
	TRNC	-	$2,196,065	97.60%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,196,065	97.60%	-	$0	-	-	$0	-	-	
NorthWestern Corporation d/b/a NorthWestern Energy		$562,500	$562,500			$0						BBB
	TRNC	-	$562,500	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$562,500	100.00%	-	$0	-	-	$0	-	-	
PacifiCorp		$3,000,000	$3,000,000			$0						A-
	TRNC	-	$3,000,000	100.00%	-	$0	-	-	$0	-	-	
	Transmission	-	$3,000,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$3,000,000	100.00%	-	$0	-	-	$0	-	-	
Pacific Northwest Generating Cooperative		$2,250,000	$2,250,000			$0						
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	

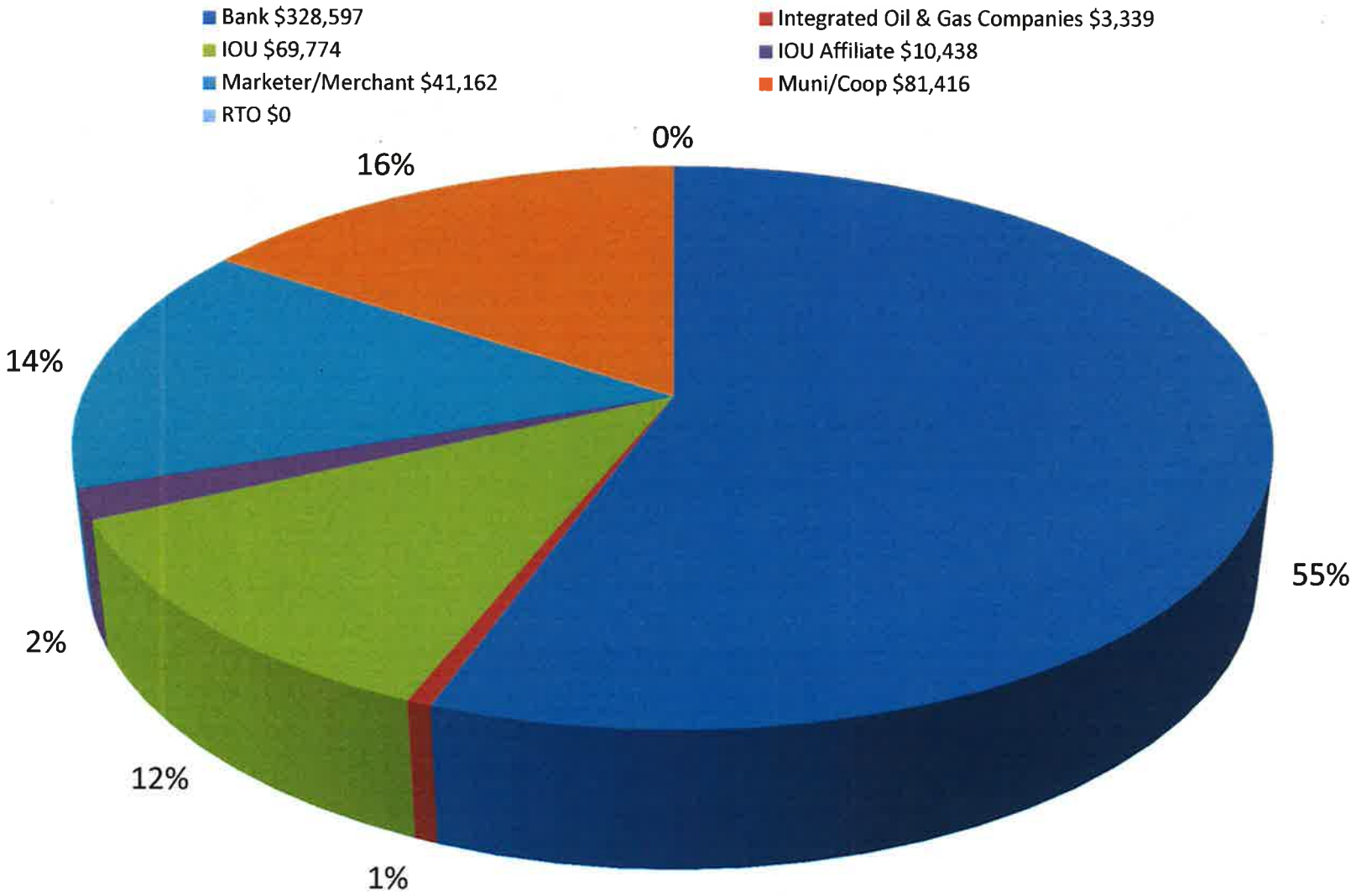
Counterparty	Agreement Type	Credit Limit	Credit Available	Percent Available	Credit Adj	Collateral	Receivable Balance	Unbilled Rec/ Pay	Fwd Physicals	Fwd Financials	Credit Exposure	S&P Rating
Portland General Electric Company		$2,250,000	$2,250,000			$0						BBB
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Powerex Corp.			$1,312,500		$0	$1,312,500						
	ISDA	-	$1,312,500	100.00%	-	$0	-	-	$0	-	-	
	NAESB	-	$1,312,500	100.00%	-	$0	-$49,288	-$642,012	$0	$0	-$691,300	
	TRNC	-	$1,312,500	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$1,312,500	100.00%	-	$0	-	-	$0	-	-	
Public Service Company of Colorado		$2,103,750	$2,103,750			$0						A-
	WSPP	-	$2,103,750	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 1 of Clark County, Washington		$2,250,000	$2,250,000			$0						
	TRNC	-	$2,250,000	100.00%	-	$0	$0	$0	$0	$0	$0	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 1 of Cowlitz County, Washington		$2,250,000	$2,250,000			$0						NR
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 1 of Franklin County, Washington		$2,250,000	$2,250,000			$0						A
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	Transmission	-	$2,250,000	100.00%	-	$0	$0	$0	$0	$0	$0	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 1 of Grays Harbor County, Washington		$2,250,000	$2,250,000			$0						A
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	Transmission	-	$2,250,000	100.00%	-	$0	$0	$0	$0	$0	$0	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 1 of Klickitat County, Washington		$1,875,000	$1,875,000			$0						BBB+
	Power	-	$1,875,000	100.00%	-	$0	-	-	$0	-	-	
	TRNC	-	$1,875,000	100.00%	-	$0	$0	$0	$0	$0	$0	
	Transmission	-	$1,875,000	100.00%	-	$0	$0	$0	$0	$0	$0	
	WSPP	-	$1,875,000	100.00%	-	$0	-	-	$0	-	-	

Counterparty	Agreement Type	Credit Limit	Credit Available	Percent Available	Credit Adj	Collateral	Receivable Balance	Unbilled Rec/ Pay	Fwd Physicals	Fwd Financials	Credit Exposure	S&P Rating
Public Utility District No. 1 of Lewis County, Washington		$2,250,000	$2,250,000			$0						
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 1 of Snohomish County		$2,250,000	$2,250,000			$0						AA-
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 2 of Pacific County, Washington		$2,250,000	$2,250,000			$0						
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Public Utility District No. 3 of Mason County		$656,250	$653,917			$0						A+
	WSPP	-	$653,917	99.64%	-	$0	$1,352	$899	$82	$0	$2,333	
Puget Sound Energy Inc.		$2,250,000	$2,250,000			$0						BBB
	NAESB	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	TRNC	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Rainbow Energy Marketing Corporation			$0			$0						
	WSPP	-	$50,000	0.00%	-	$50,000	-	-	$0	-	-	
Sacramento Municipal Utility District		$2,250,000	$2,250,000			$0						AA-
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Shell Energy North America (Canada), Inc.		$100,000	$100,000			$0						
	NAESB	-	$100,000	100.00%	-	$0	-	-	$0	-	-	
Shell Energy North America (US), L.P.		$2,150,000	$2,150,000			$0						A-
	ISDA	-	$2,150,000	100.00%	-	$0	-	-	$0	-	-	
	TRNC	-	$2,150,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,150,000	100.00%	-	$0	-	-	$0	-	-	
Tacoma Power		$2,250,000	$2,250,000			$0						AA
	Transmission	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$2,250,000	100.00%	-	$0	-	-	$0	-	-	
Tenaska Marketing Ventures			$0			$0						
	NAESB	-	$1,893,750	100.00%	-	$1,893,750	-	-	$0	-	-	

Counterparty	Agreement Type	Credit Limit	Credit Available	Percent Available	Credit Adj	Collateral	Receivable Balance	Unbilled Rec/ Pay	Fwd Physicals	Fwd Financials	Credit Exposure	S&P Rating
Tenaska Power Services Company			$1,893,750			$1,893,750						
	TRNC	-	$1,893,750	100.00%	-	$0	-	-	$0	-	-	
	Transmission	-	$1,893,750	100.00%	-	$0	-	-	$0	-	-	
	WSPP	-	$1,893,750	100.00%	-	$0	-	-	$0	-	-	
The Energy Authority, Inc.		$4,000,000	$3,926,078		$0	$0						
	Acct RMA	-	$3,926,078	98.15%	-	$0	$0	-$253,722	-$40,147	$13	-$293,856	
	Transmission	-	$3,926,078	98.15%	-	$0	$0	$72,331	$0	$1,590	$73,922	

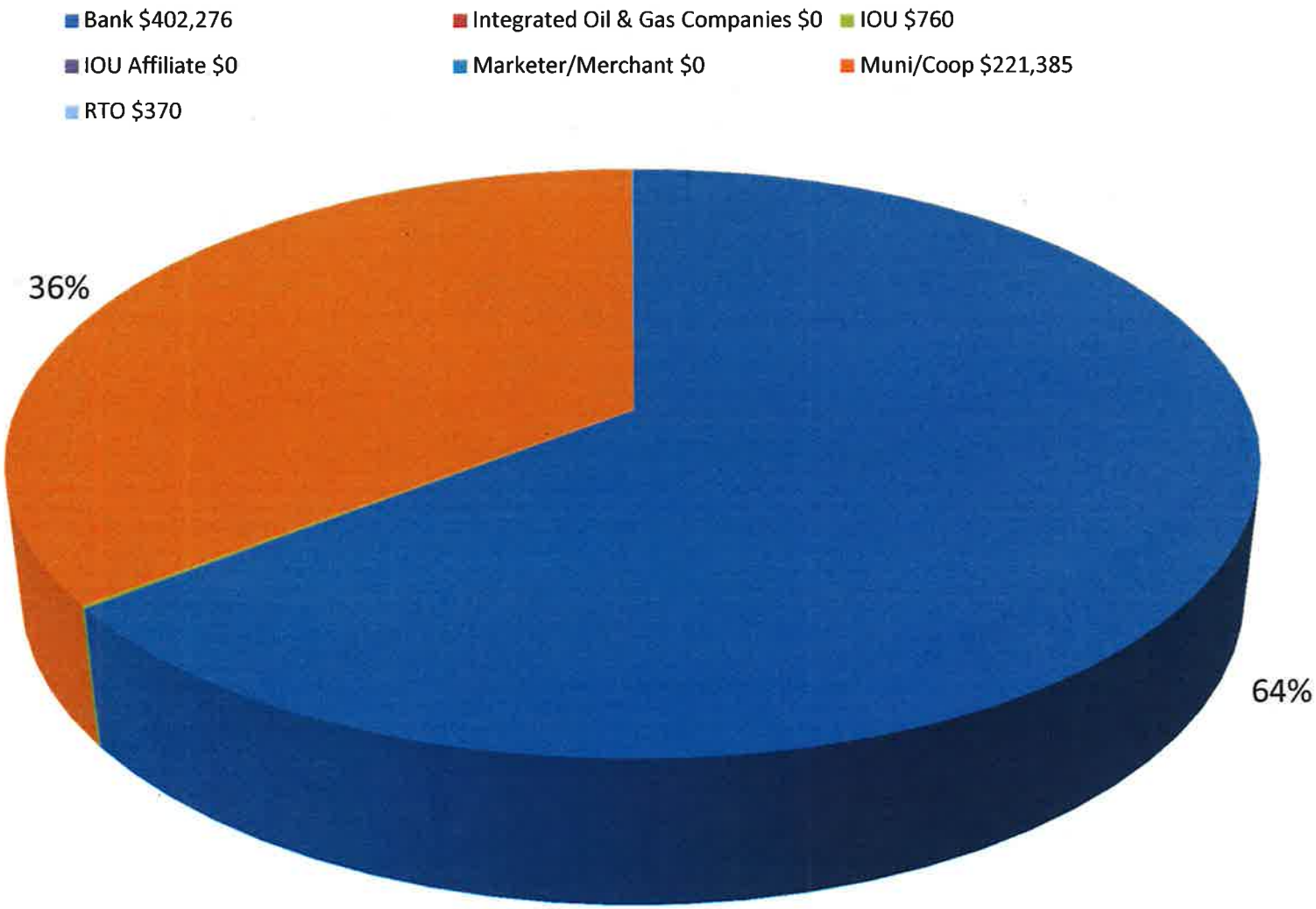
BCPD:50641:20170831:130454

Benton PUD Credit Exposure by Sector as of July 31, 2017



Benton's total exposure (principal and agent) is $534,726

Benton PUD Credit Exposure by Sector as of August 31, 2017



Benton's total exposure (principal and agent) is $624,791

Share the Road
& Save a Life

Bicycles are a legitimate form of transportation and bicyclists are legal drivers of vehicles, with laws and regulations established for their use. Yet a major issue is that many bicyclists feel they are not respected by motorists and must fight for their place on the road. Like motorists, cyclists need space to safely operate in traffic. They need to anticipate the actions of drivers and other road users. This requires mutual respect, which can be promoted by public information, motorist education programs and legal measures.

Driving on roads requires care and courtesy whether you are driving a car or a bicycle.

- Did you know bicyclists can ride on all roads, except where restricted? Bicyclists have the same rights and responsibilities as motorists, including the right to ride in the traffic lane.
- It is illegal and unsafe for bicyclists to ride against (or facing) traffic. Bicyclists should ride on the road, and must ride in the same direction as traffic.
- Motorists must maintain at least three feet of clearance when passing a bicyclist.
- When a road is too narrow for cars and bikes to ride safely side by side, bicycles should take the travel lane, which means riding in or near the center of the lane.
- Bicyclists must obey all traffic controls, signs and signals. It's the law.

KNOW THE FACTS...

In most states, a bicycle is considered a "vehicle" (like cars, trucks and motorcycles). All bike riders must follow and obey the same laws as the drivers of other vehicles.

Many pedestrian crossings are marked with a sign saying "Yield to Pedestrians," reminding motorists that pedestrians have the right-of-way. However, motorists must yield to pedestrians in crosswalks even if they're not marked.

The biggest difference between motorists and bicyclists as road users is that bicyclists are less visible, quieter and don't have a crumple zone to protect them.

Motorists

- Stay alert—avoid all distractions while driving.
- Yield to bicyclists when turning.
- In bad weather, give bicyclists extra passing room, just as you would other motorists.
- Make a visual check for bicyclists by checking mirrors and blind spots before entering or leaving a lane of traffic.
- Slow down and give at least 3 feet of clearance when passing.
- Reduce your speed when passing bicyclists, especially when the road is narrow.
- NEVER honk your horn at a bicyclist—it could cause them to swerve into traffic or off the roadway and crash.
- Always check for bicyclists before opening your car door.
- Children on bicycles are often unpredictable—expect the unexpected.

Bicyclists

- Ride on the roadway or shared pathways, rather than on sidewalks.
- Follow the same rules of the road as other roadway users, including riding in the same direction as traffic and following all the same traffic signs and signals.
- Signal all turns.
- Wear a bicycle helmet every time and on every ride.
- Be visible by wearing bright colors during the day, reflective gear in low light conditions, and use head and tail lights at night.
- Remember that respect is a two way street. Show motorists the same courtesy that you expect from them.

Remember…Same Roads ■ Same Rules ■ Same Rights

Cycling Safety

1 Minute 4 Safety

What can cyclists do to safely share the roads?

1. *Obey traffic signs and signals.*
2. *Ride WITH traffic*
3. *Follow lane markers (don't turn left from a right lane)*
4. *Don't pass on the right.*
5. *Use a rear-view mirror*
6. *Keep both hands ready to brake.*
7. ***WEAR A HELMET, DON'T RIDE WITH HEADPHONES***
8. *Dress for the weather*
9. *Use hand signals*
10. ***MAKE EYE CONTACT WITH DRIVERS***
11. *Use lights at night*
12. *Check brakes and tires regularly*
13. *Watch for roadways with Diamond "share the roads" signs*

CYCLISTS SHOULD RIDE DEFENSIVELY – DRIVERS SHOULD DRIVE DEFENSIVELY

Sharing the road with cyclists

What you should know!

Washington State DOT accident statistics from 2011-2016 show the following reported vehicle/cyclist incidents:

Kennewick – 62

Richland – 53

Pasco – 44

WASHINGTON STATE LAW considers bicycles "vehicles" on Washington roadways – the same rules apply.

WHAT CAN YOU DO/UNDERSTAND WHEN SHARING THE ROAD?

1. *Slow down and move over if possible to give add'l room (an inexperienced rider might wobble and accidentally get in your path) Some States have explicit passing requirements (3 feet) for vehicles/cyclists – Washington says to pass in a safe manner.*
2. *Pay attention to the road – even a slight collision with a car can be a severe injury or even death to a cyclist.*
3. *Not all roadways have enough shoulder to safely ride on – don't assume they can move over.*
4. *Remember they want to get out of your way.*
5. *If a cyclist is riding slightly out in the road, they may be forcing you to move out because an inexperienced rider is in front of them.*
6. *The cyclist is usually trying to get to a friendlier road to ride on and is just passing by.*

The Tri-Cities has a large cycling community made up of clubs who sponsor fundraisers for a variety of events – these clubs have over 1,000 members in total.

There are over 300 million vehicles on the road.
Americans are buying about 16 million bikes a year.
700 people a year die in bike accidents –
45,000 are injured.

WHAT ELSE SHOULD YOU THINK ABOUT?

1. *Not all bike lanes are created equal - some are wider than others – some have unexpected gravel and dangers in them that force riders to quickly move into traffic.*
2. *Watch for cyclists when turning, just like when watching for pedestrians.*
3. *They don't always hear your car coming behind them.*
4. *Are they moving out and away from a parked car – they are trying to avoid being "doored" by someone not paying attention before opening their door.*
5. *Don't turn into the bike lanes when taking a right-hand turn – a bike may be there.*

WHY CYCLE?

To commute, especially in larger cities --
It's a sport with great strength and endurance building --
It's another way to experience the outdoors and see areas you can't get to by car.

Economic concerns about high fixed charge pricing for electric service

The combined impact of a slowly growing economy, increasing adoption of energy efficiency measures and noticeable penetration of customer-sited power generation has kept utility sales in check in recent years. Many utilities suggest that improper pricing of their service is exacerbating this situation.

Pricing to signal the long-run cost of electricity use

When setting residential rates, regulators typically have two tools at their disposal—a variable (volumetric) charge that applies to electricity consumed and a fixed charge that applies to each customer regardless of electric use. A key aspect of utility pricing involves allocating costs to each component. Changes in electricity use have no effect on costs the utility previously expended to build its power plants, transmission lines and substations—those fixed costs are sunk. The efficient volumetric price reflects only those costs that vary with usage. But that notion can be misleading. The relevant economic costs are those that vary over the long run, not the short run.

The practically achievable benchmark for efficient pricing is more likely to be a type of average ***long-run*** *incremental cost, computed for a large, expected incremental block of sales, instead of a* ***short-run*** *marginal cost, estimated for a single additional sale.*[1]

In the long run, all costs are variable.[2] While increased electricity use does not affect the cost of *existing* capacity, it very well may affect the need for *new* capacity. If regulators want to promote efficient resource allocation they will set the volumetric rate above short-run variable costs to reflect full long-run cost causation. This pricing concept is not unique to utilities. Economists observe similar results in unregulated competitive markets where sustainable prices lie noticeably above short-run variable costs.[3]

Which costs belong in the customer charge?

When economist Severin Borenstein looks at the utility system through an economic lens he doesn't see a significant role for a customer charge in recovering utility fixed costs. He asks which costs the utility incurs in the process of merely connecting the customer to the system. In completing the connection, the only costs are those associated with billing administration, the meter and the service drop.[4] Cost studies suggest these distribution costs amount to about $5 per customer per month for the typical electric utility.[5] All other costs depend on usage characteristics. A new 5,000 sq. ft. home requires more system capacity than a new 500 sq. ft. efficiency apartment. Given a choice between the fixed charge and the variable charge, the volumetric charge is the more appropriate home for those capacity costs.[6] If instead they are allocated to the fixed charge, the signal is that all residential customers require the same amount of system capacity, regardless of the size of their residence.

The push for high fixed charge pricing

There is currently much interest in implementing utility pricing based on existing fixed-variable cost relationships. In contrast to the economic pricing approach, these proposed rate designs recover only average short-run variable costs in the volumetric fee, allocating all existing fixed costs to the fixed charge. Under this approach we see fixed charges as high as $70 to $80 per month, with associated variable charges in many cases of only a few pennies per kWh.

What signal does high fixed charge pricing send?

We can illustrate the drawback to such pricing with a simple scenario. With most costs recovered through the fixed charge, customers would receive the signal that increasing the cooling output from an air conditioner on a hot summer day creates no capacity costs for the utility, either in the short-run or the long run. In fact, this pricing implies that the utility never has to add capacity. That is inaccurate and if economic notions of price elasticity[7] have any meaning, moving from traditional pricing to high fixed charge pricing will lead to increased consumption in all periods, including the peak. As peak load grows the utility will then eventually add more capacity and charge the associated costs to their customers, even though the customers never received a price signal to that effect.

Is high fixed charge pricing fair?

American Electric Power finds that high fixed charge rate designs: (1) improperly allocate costs within rate classes, adversely affecting small users; (2) weaken price signals to consumers, reducing the incentive to use energy efficiently; and (3) rest on ill-defined notions of costs.[8] After assessing all the shortcomings of high fixed charge pricing, it concludes:

We believe that there are a host of alternative regulatory strategies that are far more flexible and more closely aligned with traditional regulatory practices.[9]

High fixed charge pricing negatively impacts low users, many of whom are low-income customers. Under this approach the bill for those using less than the average amount of power is higher than the bill they receive under traditional pricing. But since the fixed fee represents the bulk of the monthly bill, and that fee doesn't change with usage, customers can't do much to lower their bill.

Better pricing approaches

Rate design serves multiple purposes and there is room for innovation and compromise on this issue. Some alternatives come to mind. For example, time-differentiated pricing applies a high volumetric rate when the system is near capacity, and a low rate when demand is more limited. A recent preliminary decision at the California Public Utilities Commission finds that time-of-use rates are more cost-based than any flat volumetric rate.[10] Under this approach customers would get the correct signal that ramping up the cooling output from an air conditioner on a hot summer afternoon may increase the need for new capacity over the long run.

The minimum bill approach is another possibility. Under this rate design, the utility might charge $0.10 per kWh for all electricity consumed. There would be no explicit fixed charge, but all customers would pay at least a threshold amount, say $20 per month. A customer using 100 kWh would see a bill of $20 because the volumetric-based charge of $10 would be less than the minimum required level. In contrast, a customer using 500 kWh would simply then pay $50, all of which is usage related, because that amount exceeds the minimum threshold. While the minimum bill may overstate the customer-specific fixed costs to some extent, the Regulatory Assistance Project's Jim Lazar explains the advantage of this approach over high fixed charge pricing. We can see the proper economic pricing foundations in his description:

A minimum bill rate design has an advantage in that the per-kWh price is higher, more closely reflecting long-run marginal costs (all costs are variable in the long run). This rate design encourages prudent usage, better aligned with investment impacts from consumption and investment in energy efficiency. This means customer choices about usage and, importantly, energy-related investments, will be informed by electricity prices that reflect long run grid value.[11]

Summary

As utility markets become more complicated, regulators will be exploring new pricing approaches. High fixed charge pricing steers the economy away from efficient resource allocation, not toward it. Time-differentiated rates and minimum bill approaches offer more promise for regulators interested in sending proper signals about the long-run cost of electricity consumption. ■

[1] Kahn, *The Economics of Regulation*, MIT Press (1988), p. 85.

[2] Varian, *Intermediate Microeconomics*, W.W. Norton & Co. (2014), p. 391.

[3] Hall, "The Relation Between Price and Marginal Cost in U.S. Industry, *Journal of Political Economy* (1988).

[4] Borenstein, "What's So Great About Fixed Charges," Energy Institute at Haas, November 2014.

[5] Lazar, *Rate Design Where Advanced Metering Infrastructure Has Not Been Fully Deployed*, Regulatory Assistance Project (April 2013), p. 26.

[6] Another approach is to use a demand charge, which levy a fee based on use at a given point, not on cumulative use over time. To send a proper cost signal, however, those charges must be based on the customer's use at the time of the utility's system peak (coincident demand), and not based simply on the individual customer's peak usage. That approach is not addressed here because designing proper demand charges is a challenging task and great care must be taken when doing so to avoid price distortions and unfair outcomes.

[7] *Price Elasticity of Demand for Electricity: A Primer and Synthesis*, Electric Power Research Institute, January 2008.

[8] American Electric Power Company, *Issues in Electricity: Straight Fixed Variable*, 2014.

[9] American Electric Power Company, *supra*.

[10] *Proposed Decision*, Rulemaking 12-06-013 Before the California Public Utilities Commission, April 21, 2015, p. 117.

[11] Lazar, *Electric Utility Residential Customer Charges and Minimum Bills*, Regulatory Assistance Project, 2015, p. 4.

About the author

This summary of economic pricing principles was prepared by Steve Kihm, an economist with 35 years of experience in the field of utility regulation, including more than 20 years as an analyst at the Wisconsin Public Service Commission. His work has been published in the *Energy Law Journal*, *The Electricity Journal*, the *Journal of Applied Regulation* and *Public Utilities Fortnightly*, as well as reported in *Forbes* and the *Wall Street Journal*. He is also Senior Fellow at Michigan State University's Institute of Public Utilities.

Electric Vehicle (EV) Charging Stations

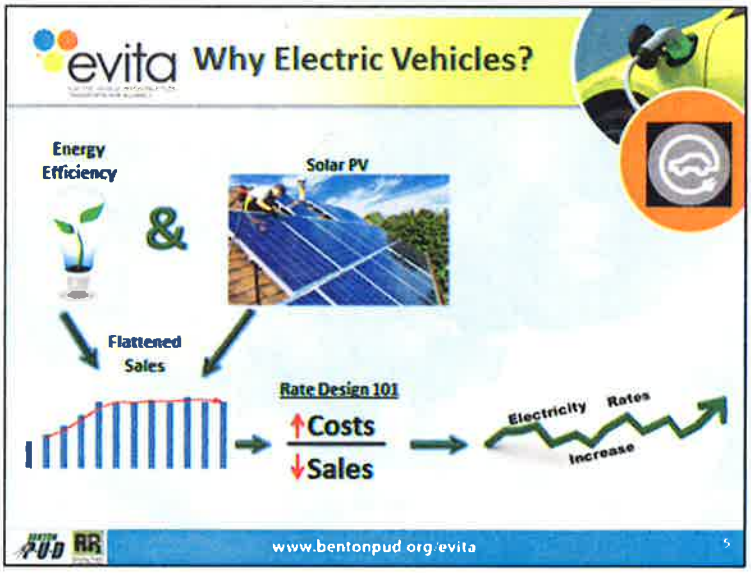
DRAFT

Overview

Today, technology improvements are expanding the opportunity for electric vehicles (EVs). EVs represent an opportunity for utilities to offset the impacts of flattening or declining electric sales associated with energy efficiency and customer-owned solar thereby mitigating upward pressure on retail rates. Electric utilities have a unique opportunity to help advance EVs by finding ways to partner with private businesses in building public charging stations. More charging stations result in less "range anxiety" ultimately leading to greater EV electric loads. In the end, EVs can create a win for utility customers, a win for our environment, and a win for our communities.

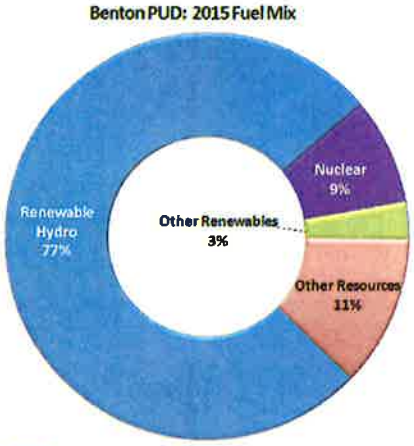
Win – Utility Customers

According to many industry experts, EVs present an opportunity for utilities to offset the impact of flattening or declining retail sales. Many utilities are experiencing lower retail sales growth due to a number of factors which may include general economic activity, energy efficiency programs, or customer self-generation from rooftop solar installations. Flattening or declining retail sales puts upward pressure on customer retail rates as general inflation causes costs to increase while sales remain stagnant (see graphic). More importantly, about one-half of total utility costs are fixed costs such as poles, wires and substations. Fixed costs do not decrease as sales flatten or decrease. As such, utilities look for ways to build new customer loads to reduce retail rate pressures on existing customers. Enter EVs. At a time where electric utilities are seeing declining load-growth rates due in part to energy efficiency and customer self-generation (two programs that Benton PUD supports), electric sales associated with EVs represent an opportunity for utilities to preserve or even grow their customer loads. Utilities have long sought new electric customers to build loads. Similar to any other new business that enters the community, EVs can generate more sales over the long run (with minimal up-front investment from the utility toward EV charging stations) that will help mitigate upward pressure on rates.

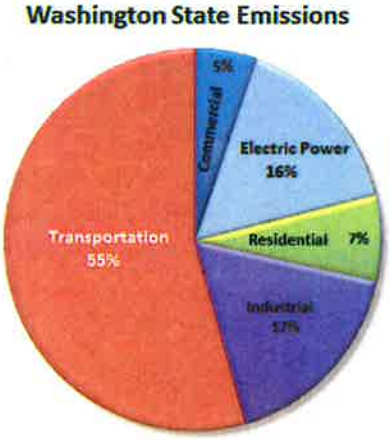


Win - Environmental Impact & Sustainability

EVs are particularly attractive to northwest electric utilities due to the regulatory environment we operate in and the resources used to serve our customers. Our energy largely comes from hydropower and nuclear, both of which are carbon-free. EVs present an opportunity to utilize the energy generated by our clean, carbonfree resources in the northwest rather than having the energy exported to other states and regions. With over 55% of the carbon emissions in Washington State originating from the transportation sector, EVs are a very attractive opportunity for carbon reduction. Put another way, EVs enable us to use more of our homegrown carbon-free energy rather than purchasing oil from foreign countries.



Source: *Washington State Electric Utility Fuel Mix Disclosure Reports for Calendar Year 2015*



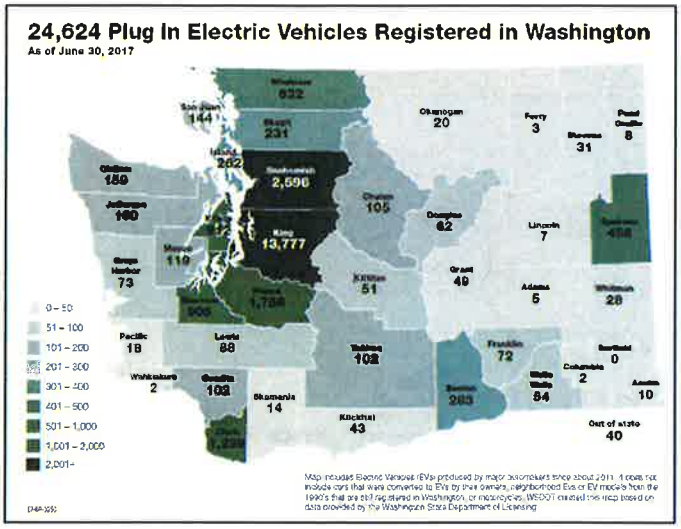
Source: US Energy Information Administration - 2014

Electric Vehicle (EV) Charging Stations

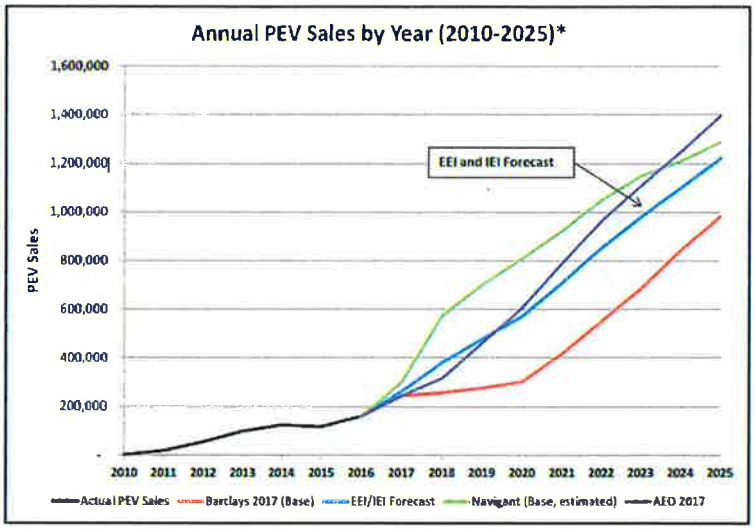
DRAFT

Win – For Our Communities

Our communities can benefit by promoting EV's in two ways - increased tourism and sustainability branding. Currently, the vast majority of EVs and charging stations are in Washington's most populous region around Puget Sound. Many travel destinations in our state are inaccessible to EV drivers, confining most travel to the Interstate 5 corridor. Travel route analysis completed by the Center for Climate and Energy Solutions in March 2015 identified charging infrastructure gaps in Washington State with specific mention of the Tri-Cities/Walla Walla area. A network of EV charging stations that connects the west side of the state to the east side will contribute to economic development by attracting business travelers and tourists from metropolitan areas with a high concentration of EVs. In addition, environmental sustainability branding has become a major objective for many communities. Building EV infrastructure is a positive step toward achieving sustainability goals.



Source: *Plug In Electric Vehicles Registered in Washington – June 2017*
http://westcoastgreenhighway.com/pdfs/Map_WAEVRegistrationByCounty.pdf



Source: *Edison Electric Institute – Plug-in Electric Vehicle Sales Forecast Through 2025 and the Charging Infrastructure Required – June 2017*
http://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20PEV%20Sales%20and%20Infrastructure%20thru%202025_FINAL%20%282%29.pdf

Will increased EV sales actually happen?

Yes. The Edison Electric Institute (EEI) recently released its *Plug-in Electric Vehicle Sales Forecast.* EEI estimates there will be more than 7 million EVs on the road by 2025, with approximately 1.2 million sold annually. Further, EEI identified a significant and growing charging infrastructure gap that needs to be addressed with more public and workplace charging infrastructure. According to EEI, approximately 70,000 public/work charging ports exist today but over 5 million charging ports will be necessary to meet the needs of the estimated 7 million EVs by 2025.

What are other utilites doing?

EV charging programs and incentives are fast becoming the norm for many utilities with the following utilities having programs that support the build-out of electric vehicle infrastructure: Avista Utilities, Clark Public Utilities, Chelan PUD, Seattle City Light, Benton REA, Inland Power & Light and many more.

Benefits of EVITA and the Washington State Department of Transportation Grant

EVITA (Electric Vehicle Infrastructure Transportation Alliance) is a combined effort of seven utilities to pursue grants for EV programs. The Washington State Department of Transportation grant created the opportunity to partner with private entities and enable Benton PUD to site a DC fast charging station and level 2 charging station at a very low cost. Through participation in EVITA, Benton PUD is well-positioned to secure the grant funds and create a win for utility customers, a win for the environment, and a win for our communities.