Fiscal Terms and Auction Format

Virginia Task Force Meeting

June 5, 2012

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Fiscal Terms

Overview

- Annual rent
  - First year's payment due within 45 days of lease execution
  - Subsequent payments due at start of each year until commercial operations on the lease begin
  - Under a phased development rent would be required on the un-developed sections until the start of commercial operations

- Annual operating fee
  - Initial fee due within 45 days of commercial operations
  - Subsequent payments due annually thereafter until commercial operations cease

- Financial assurance requirements
  - Prior to lease issuance the Lessee must provide assurance for initial financial obligations on the lease

Annual Rent Payment

- Formula: Leased acreage x $3 per acre
  - Proposed lease sale acreage offshore Virginia: 112,799 acres
  - Initial annual rent payment: $338,397
- Subsequent rent payments would reflect adjustments for relinquished acreage or phased development
- Last rent payment prior to the start of commercial operations will not be pro-rated

Annual Operating Fee

$$F = M * H * c * P * r$$

F	=	M	*	H	*	c	*	P	*	r
Annual Operating Fee		Nameplate Capacity [MW]		Hours Per Year [8,760]		Capacity Factor [0 to 1]		Power Price [$/MWh]		Operating Fee Rate [0 to 1]

- Formula is based on the value of the anticipated annual power output of a project in a regional wholesale power market times an operating fee rate

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Annual Operating Fee

$$F = M * H * c * P * r$$

F	=	M	*	H	*	c	*	P	*	r
Annual Operating Fee		Nameplate Capacity [MW]		Hours Per Year [8,760]		Capacity Factor [0 to 1]		Power Price [$/MWh]		Operating Fee Rate [0 to 1]

Generation at Continuous Full Power Operation [MWh]

- Nameplate capacity is the planned available capacity measured in megawatts (MW)

  - Based on COP to reflect installation, repowering, and decommissioning activities on the lease

  - "Generation at continuous full power operation" is nameplate capacity times the hours in the year and measured in megawatt-hours (MWh)

  - If 1,000 MW of capacity are available the maximum annual generation at full power operation would be 8.76 million MWh

Annual Operating Fee

$$F = M * H * c * P * r$$

F	=	M	*	H	*	c	*	P	*	r
Annual Operating Fee		Nameplate Capacity [MW]		Hours Per Year [8,760]		Capacity Factor [0 to 1]		Power Price [$/MWh]		Operating Fee Rate [0 to 1]

Anticipated Annual Power Output [MWh]

- The capacity factor is the share of anticipated generation relative to its generation at continuous full power operation
  - Value will be set to 0.400 for the first 8 years of commercial operations
  - Value will be adjusted in 5-year increments thereafter to reflect actual metered generation over the previous 5 years up to a range of +/- 10% of the previous period's value
  - Continuing the example, the anticipated annual power output of the project is 8.76 million MWh times 0.400, or 3.504 million MWh

Annual Operating Fee

$$F = M * H * c * P * r$$

F	=	M	*	H	*	c	*	P	*	r
Annual Operating Fee		Nameplate Capacity [MW]		Hours Per Year [8,760]		Capacity Factor [0 to 1]		Power Price [$/MWh]		Operating Fee Rate [0 to 1]

Estimated Market Value [$]

- The power price is determined at the time each payment is due based on the latest year's annual spot price index for PJM West as reported by FERC measured in $/MWh
  - Value is adjusted for inflation to the year when the payment is made
  - The 2011 PJM-West price index is $43.33/MWh which would be adjusted for one year of inflation to $44.25/MWh for payments in 2012
  - Continuing the example, the estimated market value in 2012 of the estimated annual power output is 3.504 million MWh times $44.25/MWh, or $155,052,000

Annual Operating Fee

$$F = M * H * c * P * r$$

Annual Operating Fee	Nameplate Capacity [MW]	Hours Per Year [8,760]	Capacity Factor [0 to 1]	Power Price [$/MWh]	Operating Fee Rate [0 to 1]

- Operating fee rate is the share of the estimated market value of the power produced payable to the lessor

  - The operating fee rate is 0.02 through the 8th year of commercial operations on the lease, and 0.04 thereafter

  - Continuing the example, the estimated market value of the power produced of $155,052,000 is multiplied by 0.02, resulting in an annual operating fee of $3,101,04

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Annual Operating Fee

- Recapping the example

• Nameplate Capacity	1,000 MW
• Hours Per Year	8,760
Generation at continuous full power operation	*8.76 million MWh*
• Capacity Factor	0.400
Anticipated annual power output	*3.504 million MWh*
• Power Price	$44.25/MWh
Estimated market value	*$155,052,000*
• Operating Fee Rate	0.02
Annual Operating Fee	**$3,101,040**

Phased Development

- Example: Payment at start of commercial operations on the first phase of a development in two distinct phases
  - Phase 1: Annual Operating Fee
    - 600 MW * 8,760 hours * 0.400 * $44.25/MWh * 0.02 = $1,860,624
  - Phase 2: Annual Rent
    - 45,547 acres * $3/acre = $136,641
  - Total Payment Due = $1,997,265

Phase 1	Phase 2
67,252 Acres	45,547 Acres
600 MW	400 MW

Financial Assurance

- Financial assurance is required to cover all lease obligations
  - Projected payments due over the next 12 months such as rent
  - Past due payment amounts or any other monetary obligations
  - Estimated decommissioning costs
- Financial assurances due prior to lease issuance in the form of a bond or other approved form of assurance include:
  - Initial assurance in the amount of $100,000
  - Supplemental assurance to guarantee the obligations from annual rental payments ($338,397 for the area offshore Virginia)
  - Total Initial Financial Assurance: $438,397
- Additional financial assurances will be required to address decommissioning, operating fees, and other obligations as the Lease progresses

Financial Assurance

- Any bond or other acceptable financial assurance instrument that the lessee provides must:
  - Be payable to BOEM upon demand; and
  - Guarantee compliance with all terms and conditions of the lease, any subsequent approvals and authorizations, and all applicable regulations
- All financial assurance must be in a form approved by BOEM
  - Surety bonds are the primary form of assurance
  - BOEM will consider pledges of other forms of assurance if BOEM determines that the form provides the same protection as a surety bond
    - U.S. Department of Treasury securities, cash, CDs, or savings accounts
    - Negotiable U.S. Government, State, and municipal bonds or
    - Investment-grade rate securities (AAA)
    - Insurance ("superior" rating)
  - BOEM may also consider your financial strength and reliability or third-party guarantor

Auction Format

Overview

- Lease area will be offered as a single item, or "lot"
- Sale will be conducted using an internet-based auction system
- Bidding will be on a single cash bonus amount only
- The auction will following an "ascending clock" format
  - Simple bidding procedure ensures transparent process that is easy for the seller to conduct and bidders to participate
  - Allow for price discovery process encourages bidders to bid up to their valuation of the lot, prevents over-bidding and surprise outcomes, and discourages harmful bidding practices

Ascending Clock Concept

- In the opening round the seller sets the "clock" price for the lot and bidders can either:
    - Submit an "active bid" indicating they want the lot at that price; or
    - Not submit a bid and exit the auction

- If two or more bidders submit an active bid the seller increases the clock price for the lot and conducts an additional round where active bidders from the previous round can either:
    - Submit an "active bid" indicating they want the lot at that price; or
    - Exit the auction and offer a best-and-final price, or "exit bid", between the previous and current round's price
    - Exit the auction by not bidding at all which results in an imputed exit bid price equal to the previous round's stated auction price

- Additional rounds occur as long as two or more bidders continue to submit active bids for the lot in each round, otherwise the auction ends

Winner Determination

- The lot is awarded to the sole bidder submitting an active bid in the final round of the auction at that round's stated auction price

- If an active bid is not received the lot is awarded to the bidder offering the highest actual or imputed exit bid price for the lot

- Ties among high exit bids are resolved by a random draw

Price Determination

- Price set to control the pace of the auction and allow adequate price discovery

  - The opening price is the minimum bid price ($563,995)

  - A percentage increase is applied to the previous round's price based on the level of demand and the pace of the auction

- At the opening of each round the bidders are informed of the stated auction price and the number of active bidders in the previous round

Illustrative Default Increment Percentages for a Clock Auction
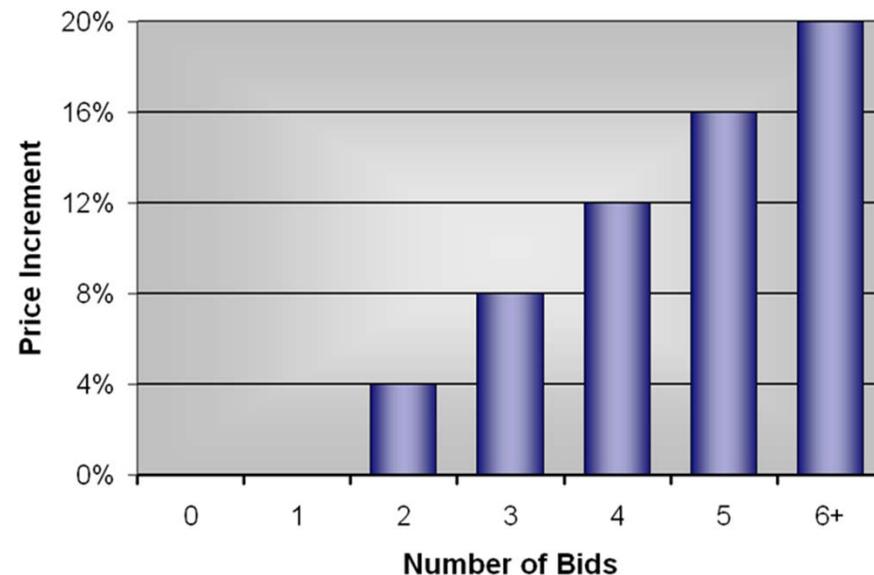
Ausubel and Cramton (2011c), p. 39.

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Bidder Default

- Winning bidder would forfeit their deposit if the lease is not executed and returned within 10 days of receipt from BOEM, or if the bidder fails to comply with applicable regulations or terms of the Final Sale Notice

- The sale area would be offered again through a subsequent auction process

Ascending Clock: Example

One Bidder in at Final Announced Price

	Single Lot		

Round 1

Announced Price: $100

Demand: 3

	Bid	Exit Bid
Bidder A	In	
Bidder B	In	
Bidder C	In	

**Bidders only see the announced price and demand at the start of each round

Ascending Clock: Example

One Bidder in at Final Announced Price

	Single Lot				Bid	Exit Bid
Round 1				Bidder A	In	
Announced Price: $100				Bidder B	In	
Demand: 3				Bidder C	In	

	Single Lot				Bid	Exit Bid
Round 2				Bidder A	Out	$105
Announced Price: $108				Bidder B	In	
Demand: 2				Bidder C	In	

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**Bidders only see the announced price and demand at the start of each round

Ascending Clock: Example

One Bidder in at Final Announced Price

	Single Lot				Bid	Exit Bid

Round 1
Announced Price: $100
Demand: 3

Bidder A	In	
Bidder B	In	
Bidder C	In	

Round 2
Announced Price: $108
Demand: 2

Bidder A	Out	$105
Bidder B	In	
Bidder C	In	

Round 3
Announced Price: $112
Demand: 1

Bidder A		
Bidder B	Out	$110
Bidder C	In	

Winner: Bidder C at $112 for the Lot

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**Bidders only see the announced price and demand at the start of each round

Ascending Clock: Example

No Bidders in at Final Announced Price

	Single Lot				Bid	Exit Bid

Round 1
Announced Price: $100
Demand: 3

Bidder A	In	
Bidder B	In	
Bidder C	In	

Round 2
Announced Price: $108
Demand: 2

Bidder A	Out	$105
Bidder B	In	
Bidder C	In	

Round 3
Announced Price: $112
Demand: 0

Bidder A		
Bidder B	Out	$110
Bidder C	Out	$111

Winner: Bidder C at $111 for the Lot

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Audience Participation

- Check the piece of paper your received at check-in for your bidder ID and auction budget for a single item

- As the auctioneer calls out each round's announced price either:

  - Keep your hand raised if the announced price is less than or equal to your budget; or

  - Lower your hand if the announced price exceeds your budget

Audience Participation

- Auction Summary

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
Round Price:	25.00	27.50	30.25	33.28	36.60	40.26	44.29	46.06
Bids:	50	40	31	24	19	12	3	0

Bidder	Budget	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
50	26	In	Out						
45	27	In	Out						
40	28	In	In	Out					
32	30	In	In	Out					
31	31	In	In	In	Out				
25	33	In	In	In	Out				
24	34	In	In	In	In	Out			
20	36	In	In	In	In	Out			
19	37	In	In	In	In	In	Out		
13	40	In	In	In	In	In	Out		
12	41	In	In	In	In	In	In	Out	
4	44	In	In	In	In	In	In	Out	
3	45	In	In	In	In	In	In	In	Out
2	45	In	In	In	In	In	In	In	Out
1	46	In	In	In	In	In	In	In	Out

Questions and Comments

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BOEM Auction Format Research

http://www.boem.gov/Renewable-Energy-Program/Regulatory-Information/Renewable-Energy-Auction-Formats.aspx