

ENERGIZING INVESTMENT PHASE 2

ROYALTY CURVES AND EMERGING RESOURCES AND TECHNOLOGIES



May 27, 2010

Context - March 11 Announcement

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Government announced the following fiscal system changes on March 11:

- Permanent 5% first year royalty rate to acknowledge that industry requires an opportunity to recover upfront investments and to encourage reinvestment.
- Set maximum rates of 40% for oil and 36% for natural gas.
- Energizing Investment: over the next 60 days, finalize new royalty curves incorporating the key design elements that will help energize investment and development activity, and unlock the potential of Alberta's vast reserves of natural gas and conventional oil.

Energizing Investment - Phase 2

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Finalized Royalty Curves:

- ▣ Natural Gas
- ▣ Conventional Oil

Natural Gas Deep Drilling Program

Emerging Resources and Technologies:

- ▣ Shale Gas
- ▣ Coalbed Methane
- ▣ Horizontal Gas
- ▣ Horizontal Oil

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Finalized Royalty Curves

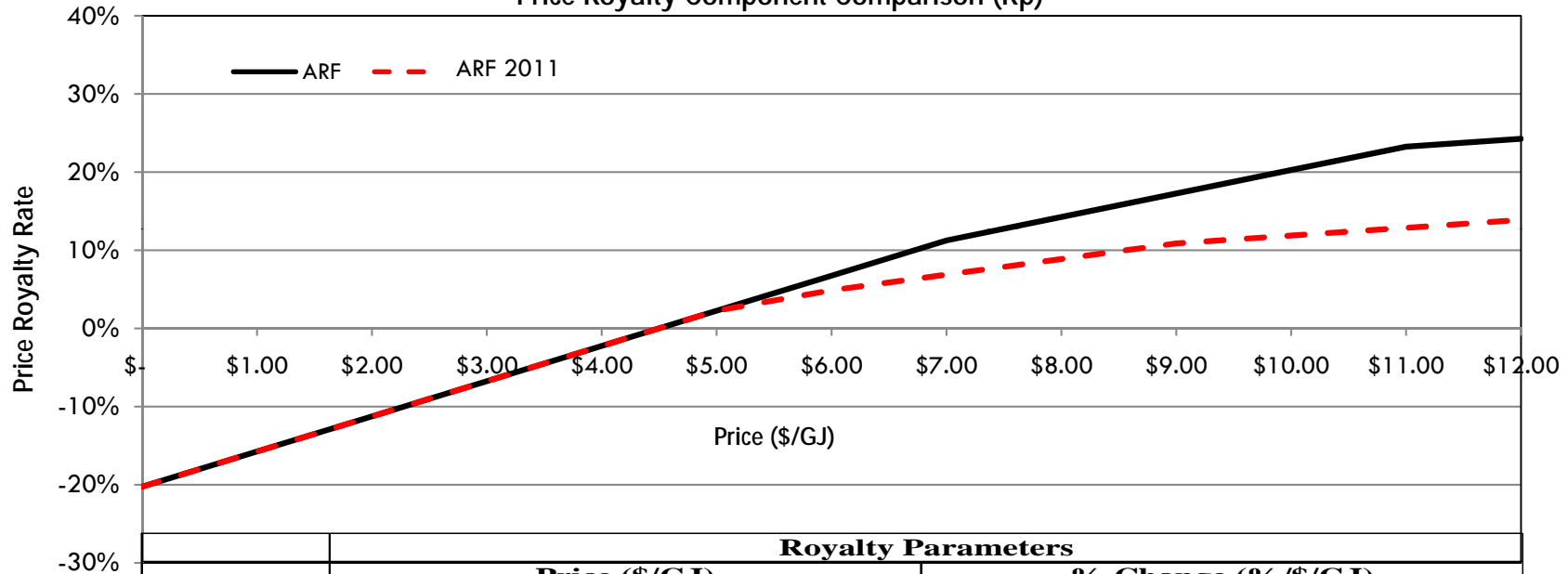
Natural Gas

Conventional Oil

Illustration of the Gas Curve

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Natural Gas
Price Royalty Component Comparison (Rp)



Royalty Parameters						
	Price (\$/GJ)			% Change (%/\$/GJ)		
	ARF 2011	ARF	Transition	ARF 2011	ARF	Transition
P₁	4.5	4.5	2	4.5%	4.5%	3.5%
P₂	5.25	7	3.25	2%	3%	0.5%
P₃	9	11	5	1%	1%	0%
	Q (10 ³ m ³ /d)			% Change (%/10 ³ m ³ /GJ)		
	ARF 2011	ARF	Transition	ARF 2011	ARF	Transition
Q₁	4	4	2	5%	5%	5%
Q₂	6	6	4	3%	3%	2%
Q₃	11	11	9	1%	1%	1%

ARF 2011: Combined royalty rate has a minimum of 5% and a maximum of 36%

ARF: Combined royalty rate has a minimum of 5% and a maximum of 36% (announced March 11, 2010)

ARF 2009: Combined royalty rate has a minimum of 5% and a maximum of 50%

Natural Gas Formula (Combined $R_p + R_q$)

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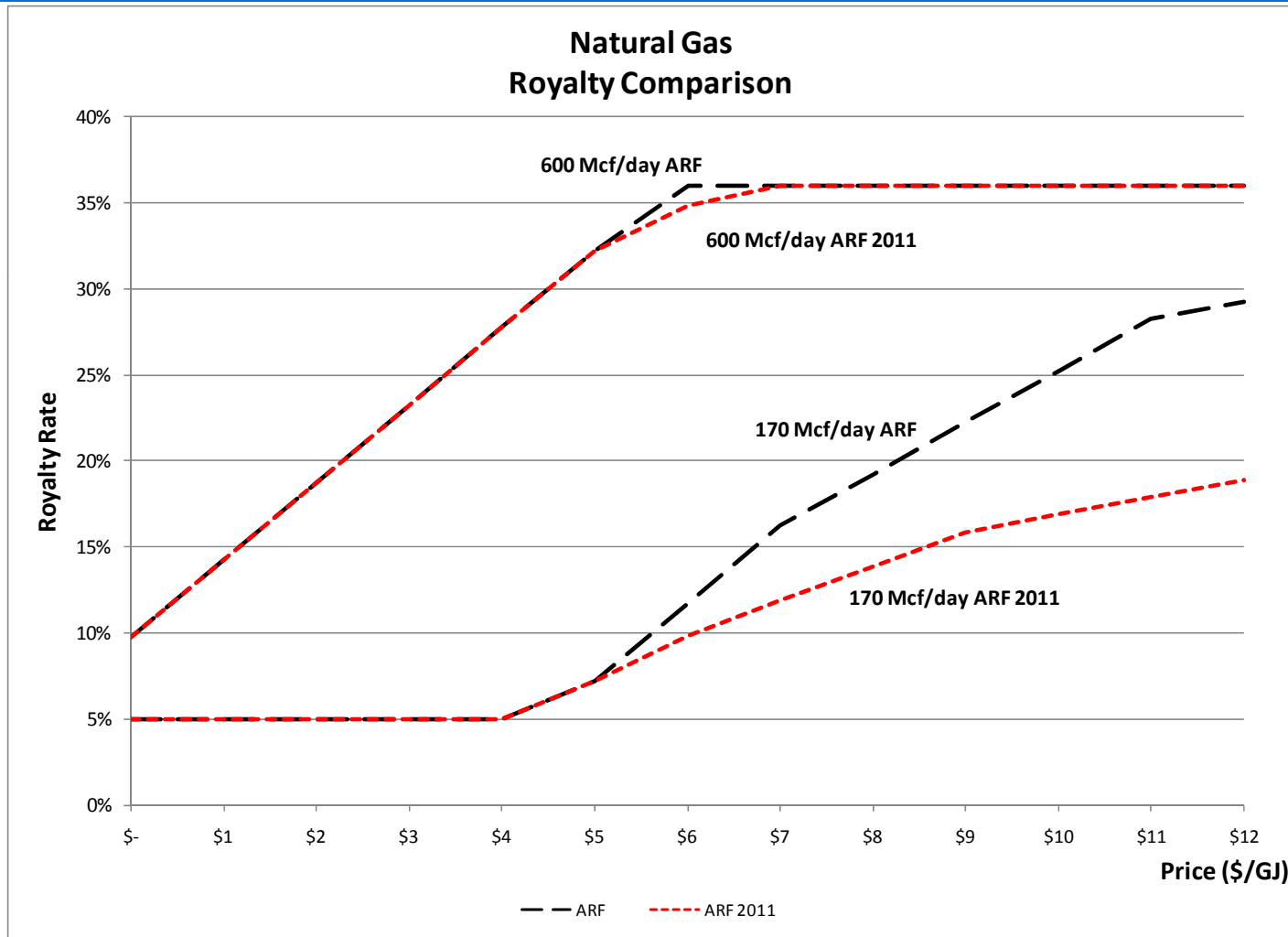
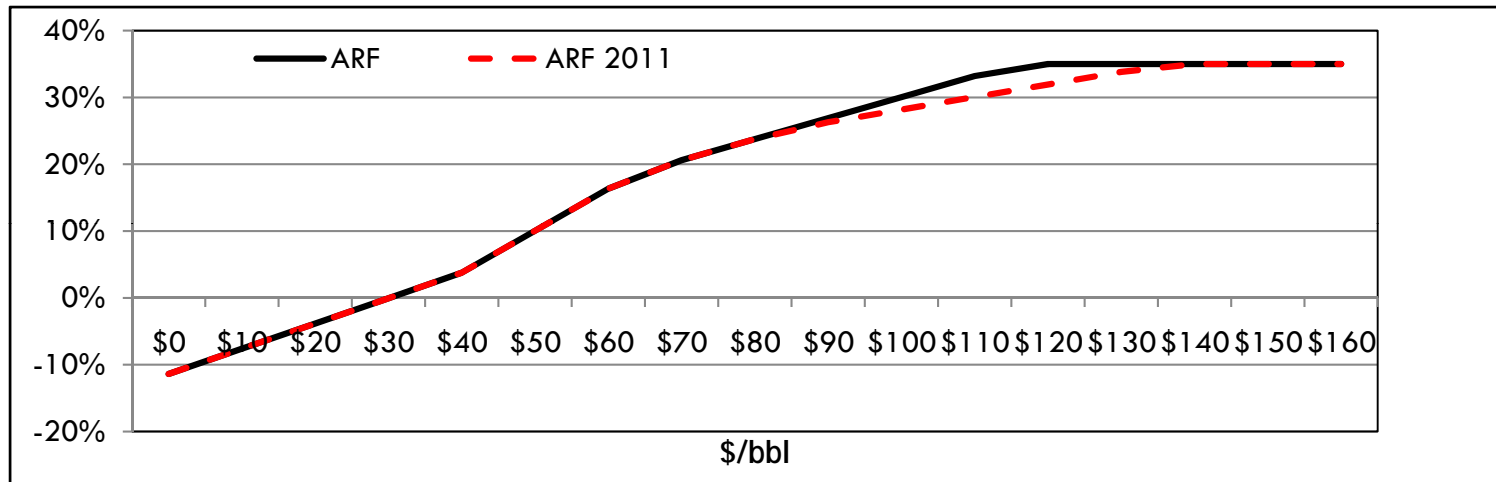


Illustration of the Oil Curve

Conventional Oil
Price Royalty Component Comparison (Rp)



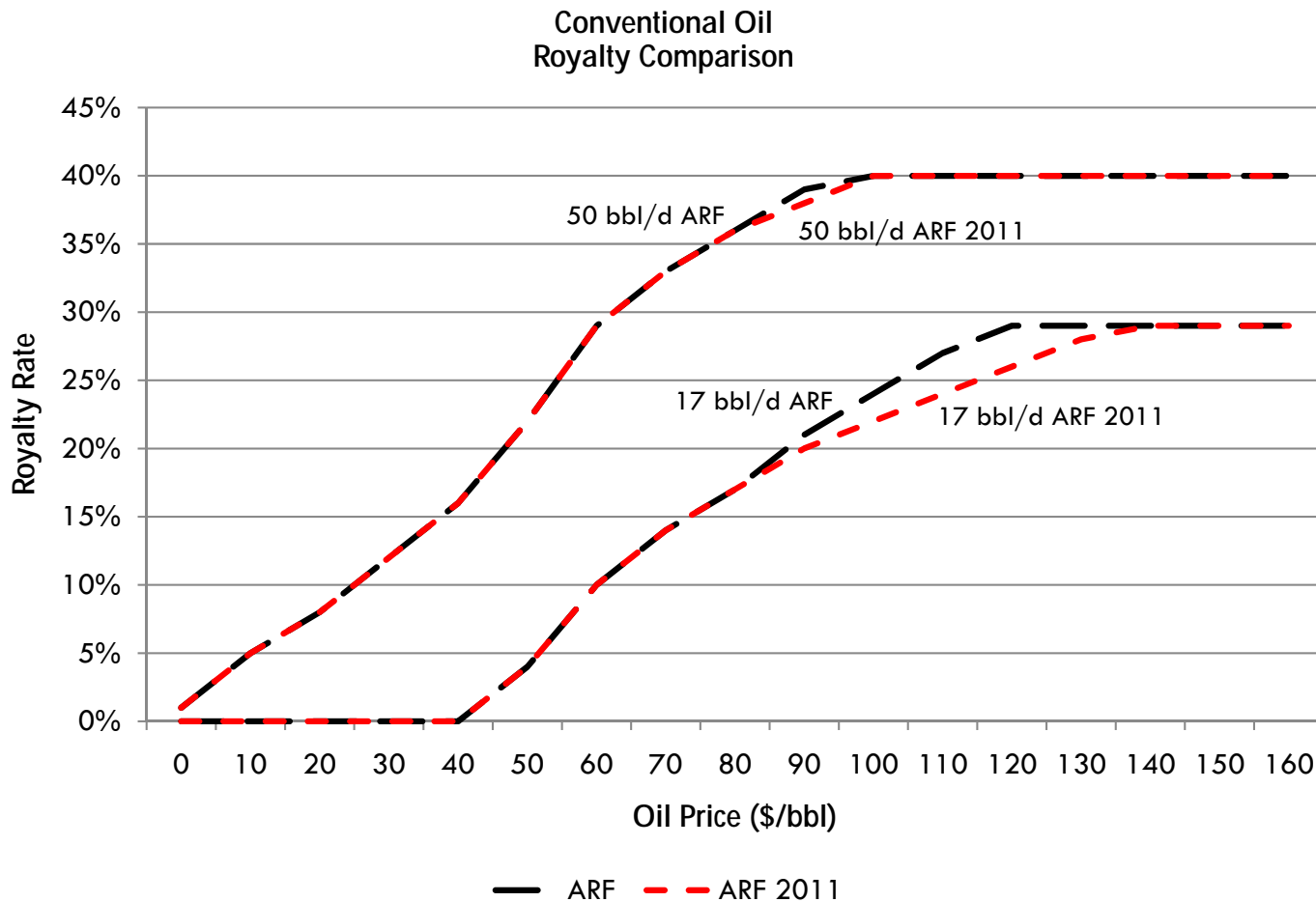
Royalty Parameters						
	Price (\$/m ³)			% Change (%/\$/m ³)		
	ARF 2011	ARF	Transition	ARF 2011	ARF	Transition
P₁	190.00	190.00	210.00	0.06%	0.06%	0.035%
P₂	250.00	250.00	250.00	0.10%	0.10%	0.01%
P₃	400.00	400.00	350.00	0.05%	0.05%	0.005%
P₄	535.00	--	--	0.03%	--	--
	Q (m ³ /month)			% Change (%/m ³ /month)		
	ARF 2011	ARF	Transition	ARF 2011	ARF	Transition
Q₁	106.4	106.4	30.4	0.26%, 0.10%	0.26%, 0.10%	0.13%
Q₂	197.6	197.6	152.0	0.07%	0.07%	0.08%
Q₃	304.0	304.0	273.6	0.03%	0.03%	0.02%

ARF 2011: Combined royalty rate has a minimum of 0% and a maximum of 40%

ARF: Combined royalty rate has a minimum of 5% and a maximum of 40% (announced March 11, 2010)

ARF 2009: Combined royalty rate has a minimum of 0% and a maximum of 50%

Oil Formula (Combined Rp + Rq)



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Natural Gas Deep Drilling Program

Natural Gas Deep Drilling Program (NGDDP)

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- Designed to encourage new exploration, development, and production from deeper higher cost natural gas wells
- All new natural gas wells spud on or after May 1, 2010 will be eligible for a revised NGDDP benefit schedule
- This program is now an ongoing feature of the royalty regime
- Adjustments to the qualifications:
 - Vertical depth requirement reduced to 2,000 metres from 2,500 metres
 - Off-target wells included
 - The wells within the pool boundaries as designated by the ERCB as of June 1, 1985 (G-Orders) included
 - Wells within a drilling spacing unit that includes another well receiving benefits are now incorporated

Natural Gas Deep Drilling Program (NGDDP)

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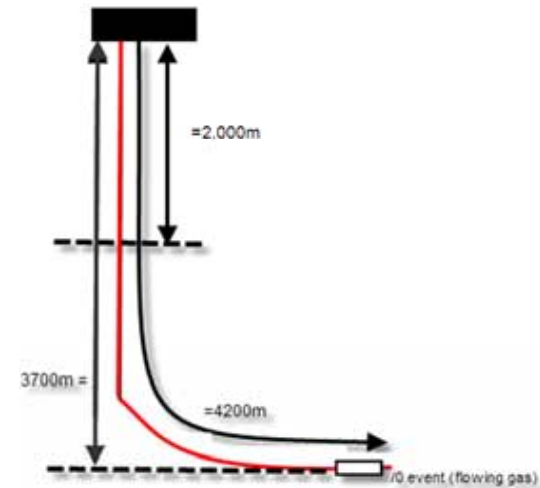
- Adjustments to the benefits:
 - ▣ \$625/metre for depths between 2,000 metres and 2,500 metres
 - ▣ Removal of the supplemental benefit of \$875,000 for wells that exceed 4,000 metres (effective after May 27, 2010)
 - ▣ Benefit schedule based on all productive legs of the well additional legs would get a \$/m credit based on the vertical depth of the lateral (less than 3,500m get \$625/m and deeper than 3,500m gets \$2,500/m)

NGDDP Example of a Lateral Well

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Exploratory well with 1 well event

- Well event/0 has a TVD of 3,700m and MD of 4,200m. An event reports production of gas and qualifies for the NGDDP benefits.
 - Benefit for the well event is calculated as follows:
 - For the MD between $2,000\text{m} < \text{Depth} \leq 3,500\text{m}$ the amount equals to $(3,500\text{ m} - 2,000\text{ m}) \times \$625/\text{m} = \$937,500$.
 - For the MD between $3,500\text{m} < \text{Depth} \leq 4,000\text{ m}$ the amount equals to $(4,000\text{ m} - 3,500\text{m}) \times \$2,500/\text{m} = \$1,250,000$.
 - For the MD between $4,000\text{m} < \text{Depth} \leq 5,000\text{m}$ the amount equals to $(4,200\text{m} - 4,000\text{m}) \times \$3,125/\text{m} = \$625,000$.
 - Maximum royalty adjustment for this well \$2,812,500.

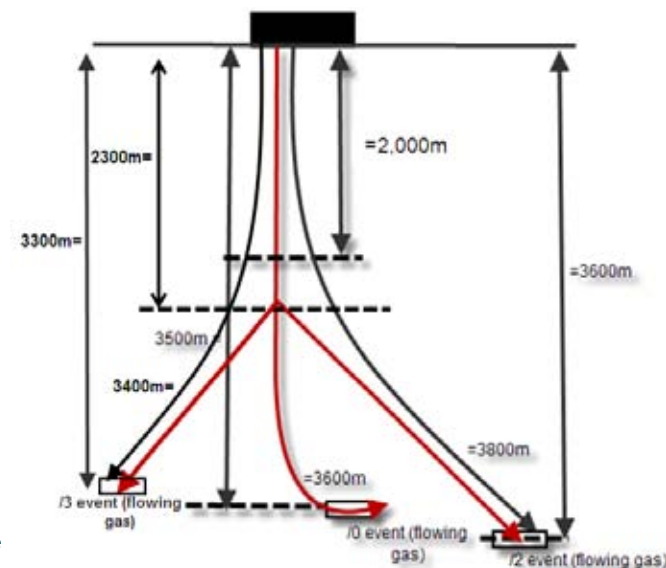


NGDDP Example of a Multi-leg Well

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A development well with 3 well events

- Well event/0 has a TVD of 3,500m and MD of 3,600m.
Well event/2 has a TVD of 3,600m and MD of 3,800m.
Well event/3 has a TVD of 3,300m and MD of 3,400m.
All three events report gas production and qualify for the NGDDP benefits.
- Benefit of the deepest lateral well event/2:
 - For the MD between $2,000\text{m} < \text{Depth} \leq 3,500\text{m}$ the amount equals to $(3,500\text{m} - 2,000\text{m}) \times \$625/\text{m} = \$937,500$.
 - For the MD between $3,500\text{m} < \text{Depth} \leq 4,000\text{m}$ the amount equals to $(3,800\text{m} - 3,500\text{m}) \times \$2,500/\text{m} = \$750,000$.
 - Total benefit is \$1,687,500.
- Benefit of the additional legs:
 - The measured depth at the start of the well event/0 leg is 2,300m and the TVD of well event/0 is 3,500m. Therefore, the length of the lateral from the kick-off point to the perforation is 1,300m ($3,600\text{m} - 2,300\text{m}$).
 - For the $\text{TVD} \geq 3,500\text{m}$ the amount equals to $1,300\text{m} \times \$2,500/\text{m} = \$3,250,000$.
 - The measured depth at the start of the well event/3 leg is 2,300m. Therefore, the length of the lateral from the kick-off point to the perforation is 1,100m ($3,400\text{m} - 2,300\text{m}$).
 - For the $\text{TVD} < 3,500\text{m}$ the amount equals to $1,100\text{m} \times \$625/\text{m} = \$687,500$.
- Maximum royalty adjustment for this well is \$5,625,000 ($\$1,687,500 + \$3,250,000 + \$687,500$).



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Emerging Resources and Technologies

Shale Gas

Coalbed Methane

Horizontal Gas

Horizontal Oil

Emerging Resources and Technologies

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- Discussions with industry identified 4 situations where it is appropriate to extend the 5% royalty rate on a temporary basis to acknowledge higher costs and risks associated with emerging resources and technologies.
- Government recognizes the need to provide certainty for investors to facilitate large capital investments made over many years.
- Government will review these temporary extensions of the 5% royalty rate in 2014 and commit to providing 3 years notice prior to eliminating them.

Shale Gas

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- Designed to accelerate the acquisition of knowledge and ultimately to achieve commercial natural gas production from shale deposits.
- Applies to all wells that start producing on or after May 1, 2010 from shale specific targets.
- Extends the 5% front end rate to 36 production months with no volume limit.
- Qualification would be based on shale gas designation by the ERCB and would exclude wells that produce simultaneously from other non shale zones (e.g., commingled production with non-shale gas, or from zones that are not “true shales”).

Coalbed Methane (CBM)

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- Targeted at (but not limited to) the Mannville coal seam which requires dewatering prior to production.
- Applies to all wells that start producing on or after May 1, 2010 from CBM specific targets.
- Extends the 5% front end rate to 36 production months with a volume limit of 750 million cubic feet.
- Qualification would be based on CBM designation by the ERCB and would exclude wells that produce simultaneously from other non CBM zones (e.g., commingled production with non-coalbed methane).

Horizontal Gas

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- Recognizes the increased costs and risks associated with new technologies required for more challenging horizontal gas drilling.
- Applies to all new horizontal gas wells spud on or after May 1, 2010.
- Extends the 5% front end rate to 18 production months with a volume limit of 500 million cubic feet.

Horizontal Oil

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- Recognizes the increased costs and risks associated with new technologies required for more challenging horizontal oil drilling
- Applies to all new horizontal oil wells spud on or after May 1, 2010
- Extends the 5% front end rate as follows:
 - less than 2,500 metres = 50,000 boe and 18 production months
 - 2,500 up to 3,000 metres = 60,000 boe and 24 production months
 - 3,000 up to 3,500 metres = 70,000 boe and 30 production months
 - 3,500 up to 4,000 metres = 80,000 boe and 36 production months
 - 4,000 up to 4,500 metres = 90,000 boe and 42 production months
 - more than 4,500 metres = 100,000 boe and 48 production months

Emerging Resources and Technology Summary

	Applies to	Maximum 5% Royalty Rate for	
		Time Limit	Volume Limit
Shale Gas	Well events that start producing gas exclusively from shale zones on or after May 1, 2010	36 production months commencing with the first month of production	No volume limitation
Coalbed Methane	Well events that start producing gas exclusively from coal zones on or after May 1, 2010	36 production months commencing with the first month of production	750 million cubic feet of gas production
Horizontal Gas	Horizontal gas wells drilled (spud) on or after May 1, 2010	18 production months commencing with the first month of production from the well event	500 million cubic feet of gas production
Horizontal Oil	Horizontal oil wells drilled (spud) on or after May 1, 2010	less than 2,500 m = 18 production months 2,500 up to 2,999 m = 24 production months 3,000 up to 3,499 m = 30 production months 3,500 up to 3,999 m = 36 production months 4,000 up to 4,499 m = 42 production months 4,500 m or more = 48 production months Whichever is reached first (time or production)	50,000 boe 60,000 boe 70,000 boe 80,000 boe 90,000 boe 100,000 boe Whichever is reached first (time or production)

NGDDP Benefits – Development Wells – Deepest Leg

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Depth	NGDDP Royalty Adjustment Per Well Development Wells Benefit per metre drilled in the depth range (\$/m)			
	>2,000 – 3,500	>3,500 – 4,000	>4,000 – 5,000	>5,000
> 2,000	\$625			
> 3,000	\$625			
> 3,500	\$625	\$2,500		
> 4,000	\$625	\$2,500	\$2,500	
> 4,500	\$625	\$2,500	\$2,500	
> 5,000	\$625	\$2,500	\$2,500	\$3,000

NGDDP Benefits – Exploratory Wells – Deepest Leg

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Depth	NGDDP Royalty Adjustment Per Well Exploratory Wells Benefit per metre drilled in the depth range (\$/m)			
	>2,000 – 3,500	>3,500 – 4,000	>4,000 – 5,000	>5,000
> 2,000	\$625			
> 3,000	\$625			
> 3,500	\$625	\$2,500		
> 4,000	\$625	\$2,500	\$3,125	
> 4,500	\$625	\$2,500	\$3,125	
> 5,000	\$625	\$2,500	\$3,125	\$3,750

NGDDP Benefits for Additional Laterals

NGDDP Royalty Adjustment Benefits for Additional Laterals Benefit per metre drilled in the depth range (\$/m)	
Qualifying vertical depth (TVD of the Well Event)	Benefit per drilled metre (Measured Depth – Kick-off Point of the Well Event)
< 3,500	\$625
>= 3,500	\$2,500

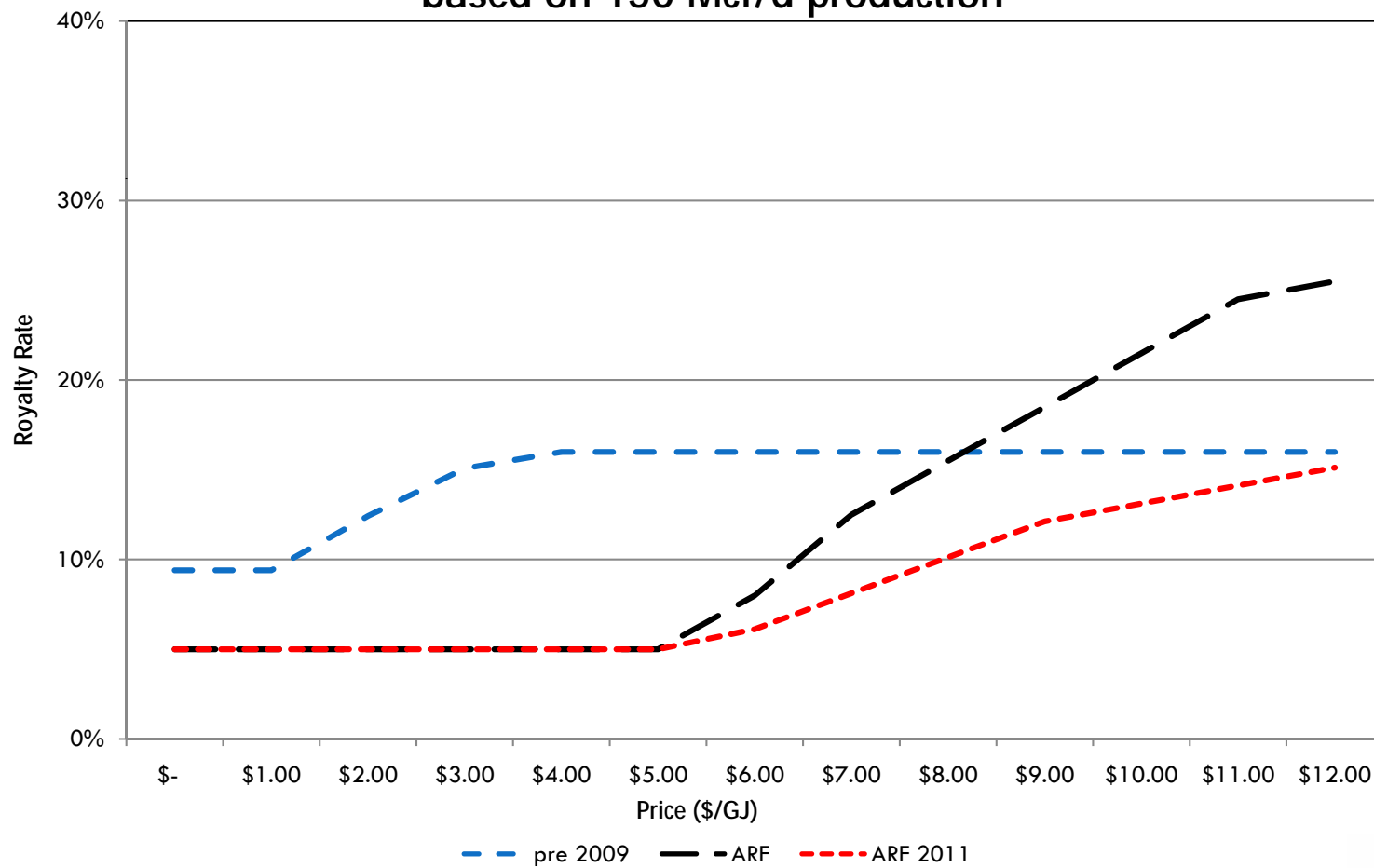
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Additional Illustrations of the Royalty Curves

Natural Gas Royalty Curve

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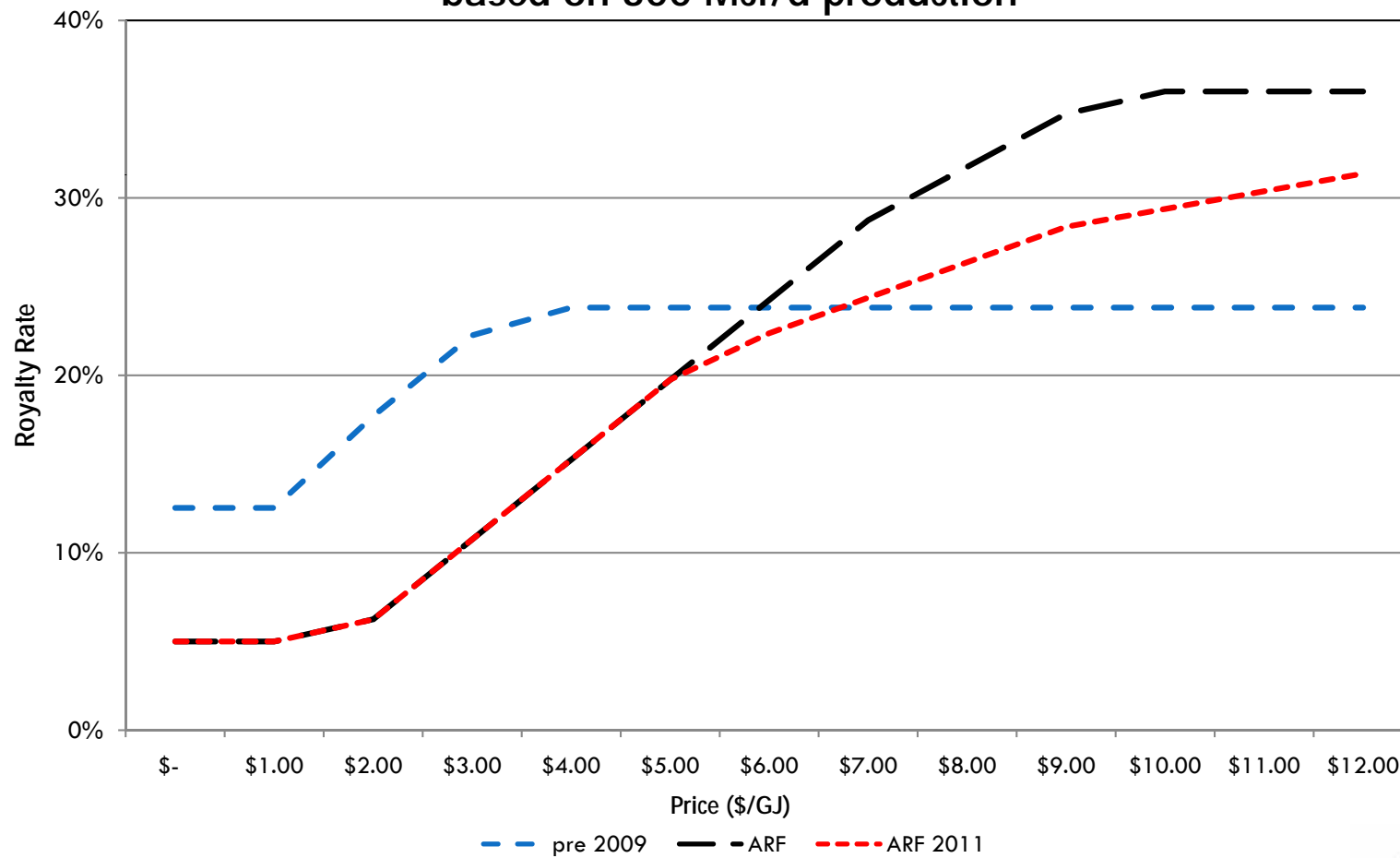
Natural Gas Royalty Rates Comparison based on 150 Mcf/d production



Natural Gas Royalty Curve

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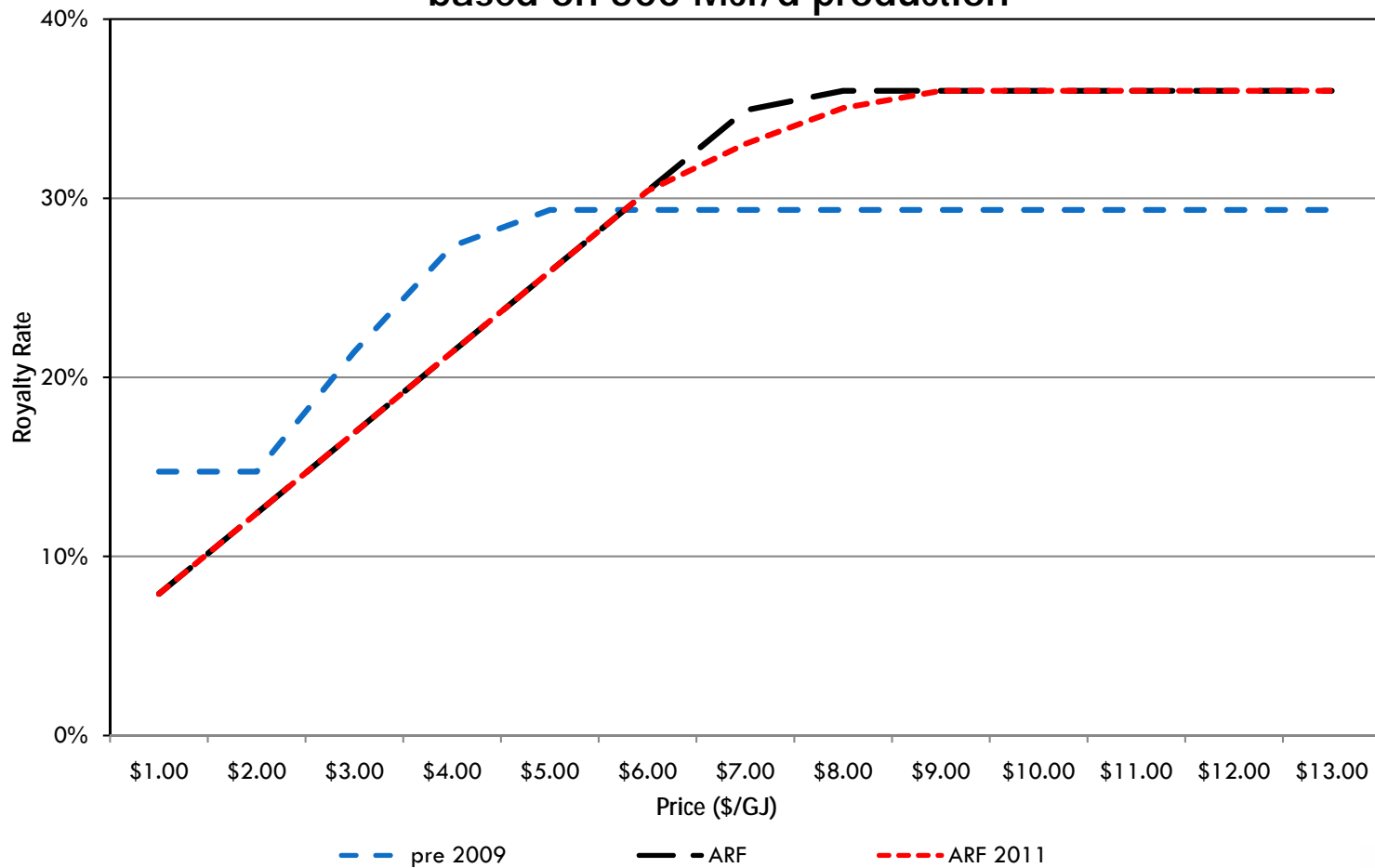
Natural Gas Royalty Rates Comparison
based on 300 Mcf/d production



Natural Gas Royalty Curve

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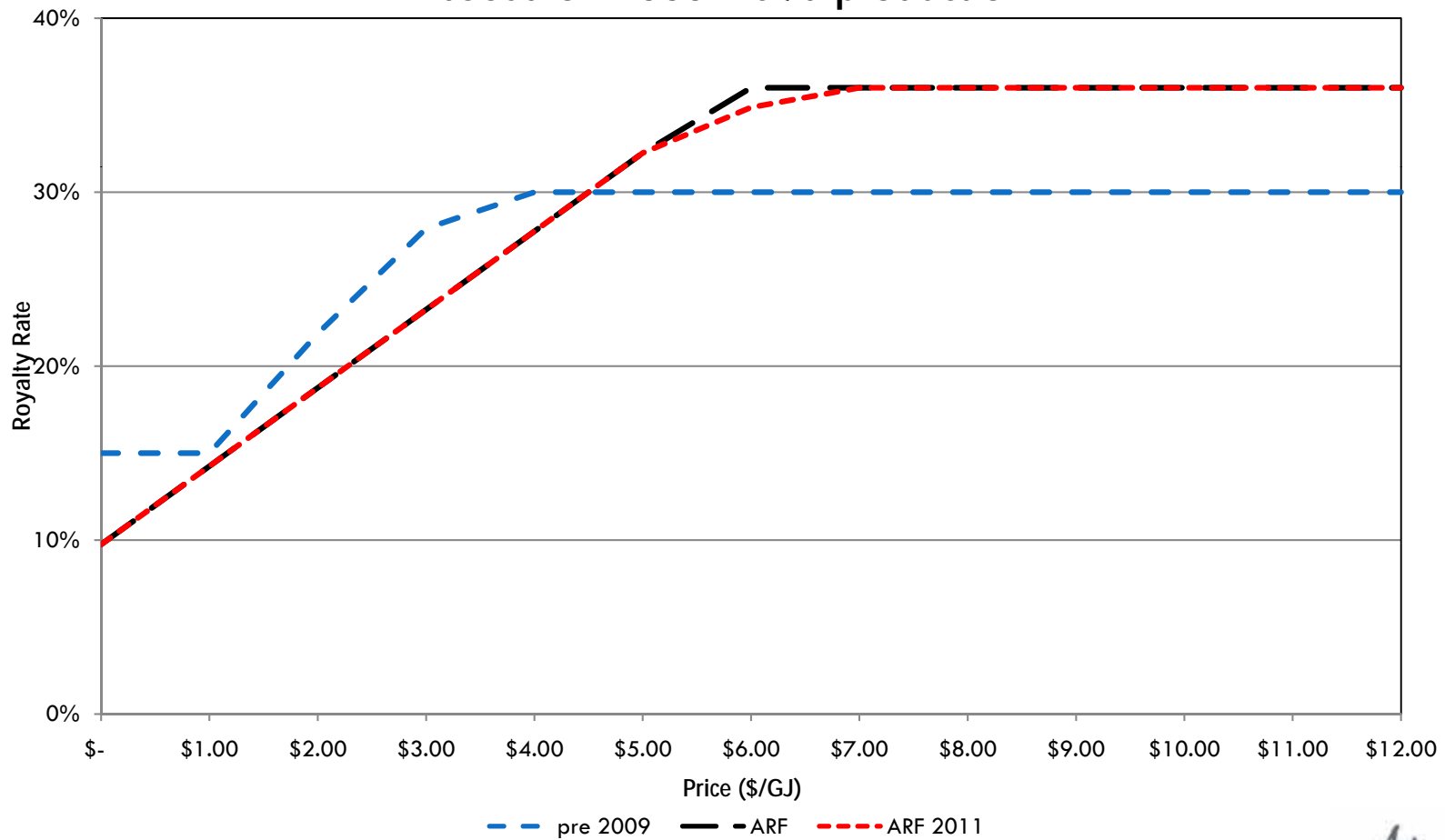
Natural Gas Royalty Rates Comparison based on 500 Mcf/d production



Natural Gas Royalty Curve

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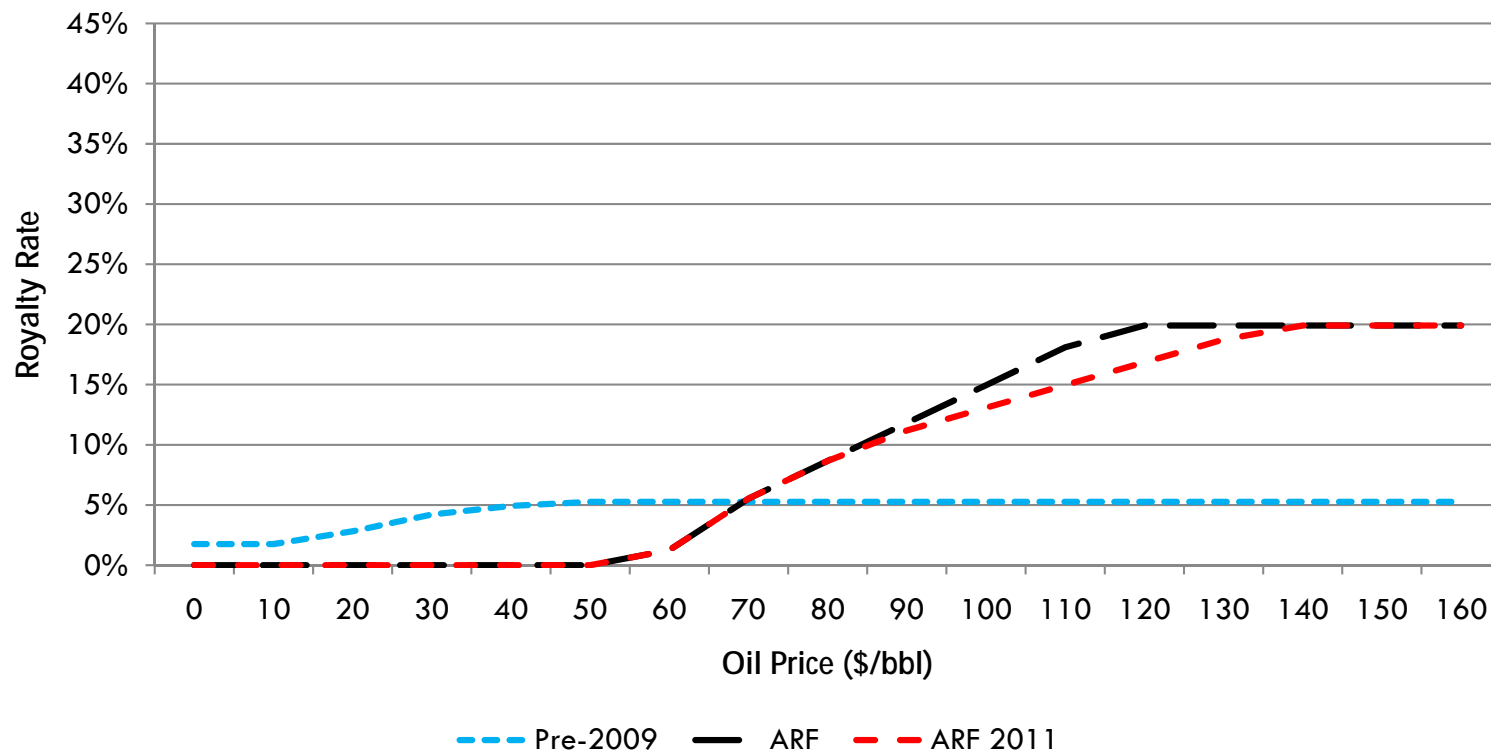
Natural Gas Royalty Rates Comparison based on 1000 Mcf/d production



Oil Royalty Curve

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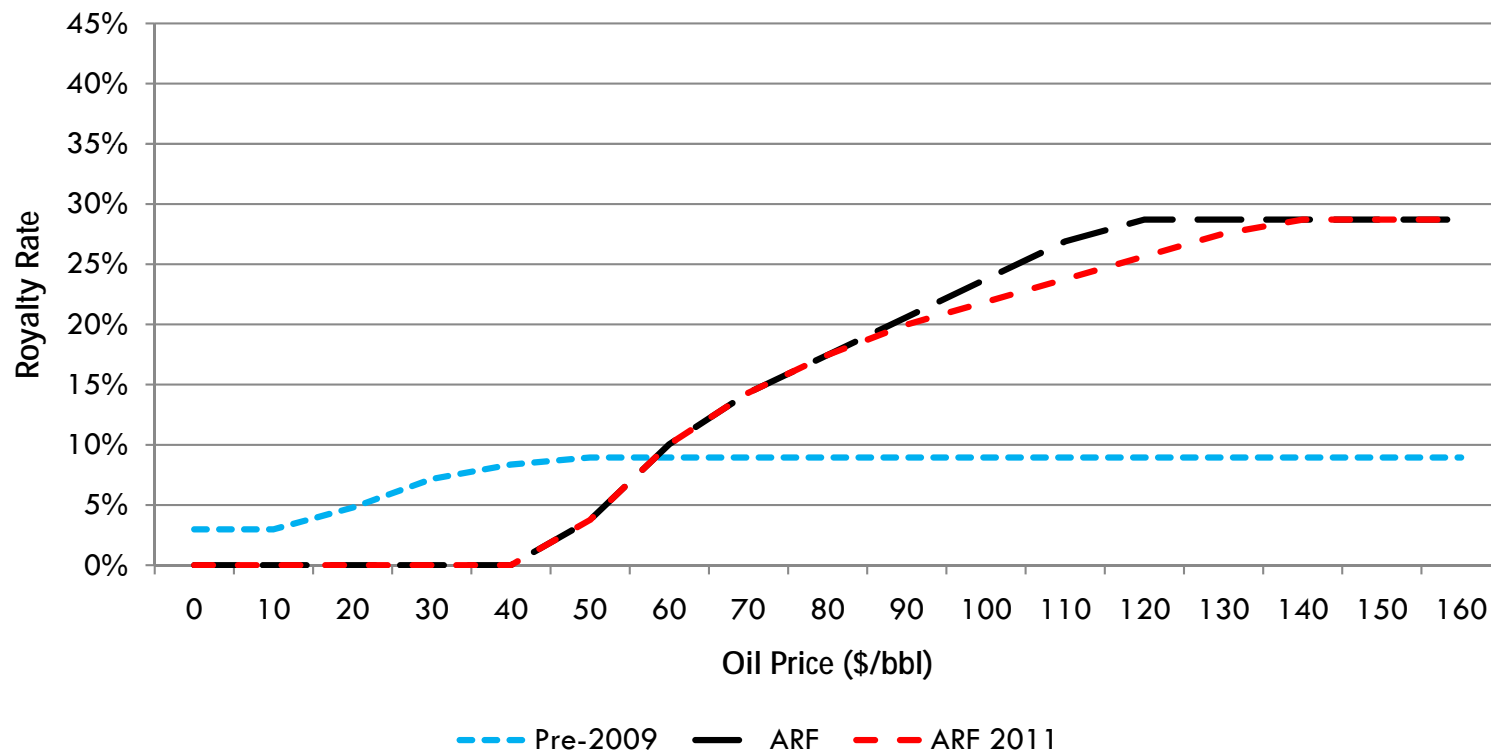
Oil Royalty Rates Comparison based on 10 bbl/d Production



Oil Royalty Curve

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Oil Royalty Rates Comparison based on 17 bbl/d Production



Oil Royalty Curve

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Oil Royalty Rates Comparison based on 50 bbl/d Production

