
Petroleum Fiscal Design Model Instructions



Castle Gap Advisors, LLC.
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House Finance Committee

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- Identification of model components
- Explanation of chart components
- Example runs/analysis

Excel Model Components

Excel Model Components

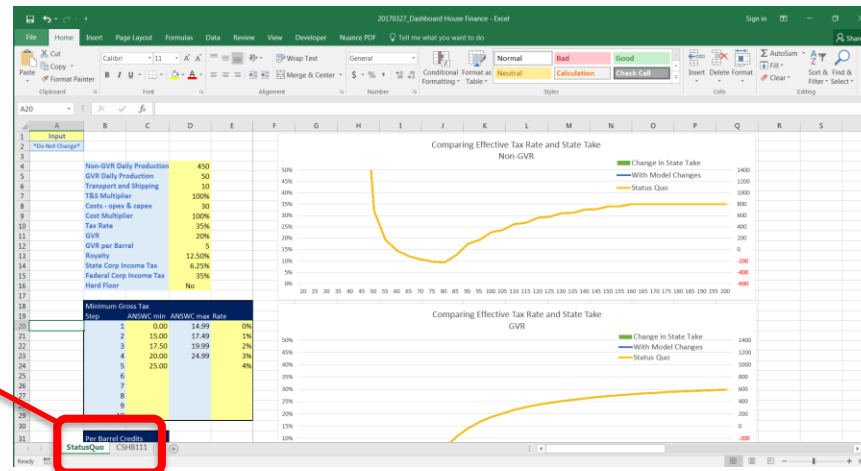
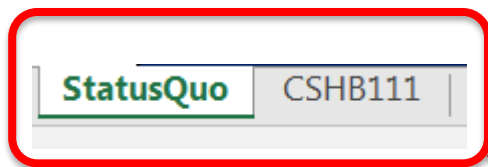
General

- File name: 20170327_Dashboard House Finance
- Purpose: At a given price, to view the magnitude of change in effective tax % paid and revenue to the state based on changing legislation parameters from StatusQuo or CSHB111
 - Example: What will be the increase of state revenue by raising the minimum tax from 4% to 5%?
- Limitations: This model is not a life-cycle model, i.e. it does not produce results over a time period. The results are for a snapshot in time, showing the effects at price points between \$20-\$200/bbl

Excel Model Components

Worksheets

- There are two “worksheets” or tabs, named “StatusQuo” and “CSHB111”



- StatusQuo: Use this tab to analyze changes against the “StatusQuo” legislation, the current legislation in place today
- CSHB111: The revenue and effective tax curves are set to the parameters in CSHB111. Use this tab to analyze changes against the “CSHB111” proposed legislation

Both worksheets are identical, except for the baseline comparison

Excel Model Components

Color Coding

- In the top left there is a color code legend:

Input
Do Not Change

 - The yellow cells are for the user to input values for analysis
 - The blue cells contain a formula and should not be changed
 - ***Changing these cells will “break” the model and return erroneous results***
 - In addition, the tables starting in column AA should not be changed

■ Example

- In the table below, the two columns in yellow are for user input. The columns in blue will recalculate depending on what the user enters in the yellow cells

Minimum Gross Tax			
Step	ANSWC min	ANSWC max	Rate
1	0.00	14.99	0%
2	15.00	17.49	1%
3	17.50	19.99	2%
4	20.00	24.99	3%
5	25.00		4%
6			5%
7			6%
8			7%
9			8%
10			9%

Excel Model Components

Inputs

- The table to the right contains the first set of parameters to set
- Definitions:
 - **Non-GVR Daily Production**: Non-GVR eligible production, thousand barrels per day
 - **GVR Daily Production**: GVR eligible production, thousand barrels per day
 - **Transportation & Shipping**: Per barrel cost for shipping and transportation
 - Ex: In some fields this is closer to \$10/bbl, in others it's as high as \$27/bbl
 - **T&S Multiplier**: Applies a % change to the T&S, quickly showing how the system reacts to change in T&S
 - **Costs- opex & capex**: Per barrel cost when opex and capex are combined
 - These change up and down, generally in line with oil price
 - **Cost Multiplier**: Applies a % change to the line above, thus 100% makes no change

Non-GVR Daily Production	450
GVR Daily Production	50
Transport and Shipping	10
T&S Multiplier	100%
Costs - opex & capex	30
Cost Multiplier	100%
Tax Rate	35%
GVR	20%
GVR per Barrel	5
Royalty	12.50%
State Corp Income Tax	6.25%
Federal Corp Income Tax	35%
Hard Floor	No

Excel Model Components

Inputs

■ Definitions Continued:

- **Tax Rate:** Statutory petroleum Tax rate
- **GVR:** Percent reduction in the gross value at the lease (GVPP)
- **GVR per Barrel:** Per barrel credit granted to GVR eligible fields
- **Royalty:** Royalty percentage applied to production
 - Example: To model a royalty relief scenario, you can type in a decreased royalty rate
- **State Corp. Income Tax:** SCIT rate
- **Federal Corp Income tax:** FCIT rate
- **Hard Floor:** Yes or no, depending if a hard floor should or should not be considered

Click in the cell to the right of “Hard Floor” and an arrow will appear, click the arrow to show options of yes or no, and click the desired option

Hard Floor	Yes
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Non-GVR Daily Production	450
GVR Daily Production	50
Transport and Shipping	10
T&S Multiplier	100%
Costs - opex & capex	30
Cost Multiplier	100%
Tax Rate	35%
GVR	20%
GVR per Barrel	5
Royalty	12.50%
State Corp Income Tax	6.25%
Federal Corp Income Tax	35%
Hard Floor	No

Excel Model Components

Inputs Continued

- The Minimum Gross Tax table can be used to set the minimum tax at different price brackets. The steps in the table to the right are the StatusQuo
- Up to 10 steps can be entered into the table. For example, by adding the 30 in the 6th step, it ends the 4% minimum tax at 29.99 and begins the 5% bracket at 30.00
 - In addition, the percentages in the column to the very right can be changed.

Minimum Gross Tax				
Step	ANSWC min	ANSWC max	Rate	
1	0.00	14.99		0%
2	15.00	17.49		1%
3	17.50	19.99		2%
4	20.00	24.99		3%
5	25.00			4%

Minimum Gross Tax				
Step	ANSWC min	ANSWC max	Rate	
1	0.00	14.99		0%
2	15.00	17.49		1%
3	17.50	19.99		2%
4	20.00	24.99		3%
5	25.00	29.99		4%
6	30			5%
7				6%
8				7%
9				8%
10				9%

Excel Model Components

Inputs Continued

- The Per Barrel Credits table allows you to set the per barrel credit structure in any way you would like
 - Start Price: The price up to which the highest credit applies
 - Price Step: The step size in \$/bbl for the next credit level
 - Max Credit: The highest per barrel credit amount
 - Credit Step: The amount by which the per barrel credit changes with each step
 - Min Credit: The lowest per barrel credit amount
- The example to the right has the per barrel credit structure set as StatusQuo
 - Starting at \$80/bbl and \$8/bbl credit, the credit decreases by \$1/bbl for each \$10 change in price per barrel, until the per barrel credits are \$0/bbl
- The table with blue cells to the right calculates the correct per barrel credit at a given price based on your inputs. As you change the inputs, it will automatically recalculate

Per Barrel Credits	
Start Price	80.00
Price Step	10.00
Max Credit	8.00
Credit Step	1.00
Min Credit	0.00

Per Barrel Credits				
Step	\$/bbl	GVPP M	\$/bbl	GVPP M Rate
1		0.00	79.99	8.00
2	80.00		89.99	7.00
3	90.00		99.99	6.00
4	100.00		109.99	5.00
5	110.00		119.99	4.00
6	120.00		129.99	3.00
7	130.00		139.99	2.00
8	140.00		149.99	1.00
9	150.00		159.99	0.00
10	160.00			0.00

Chart Components

Chart Components

- The two main charts comparing effective tax rate vs the change in state take have three series, representing the same categories in each chart
- The chart can be explained in three components

1 The orange line represents the baseline effective tax curve for comparison, either CSHB111 or StatusQuo, depending on which worksheet you use

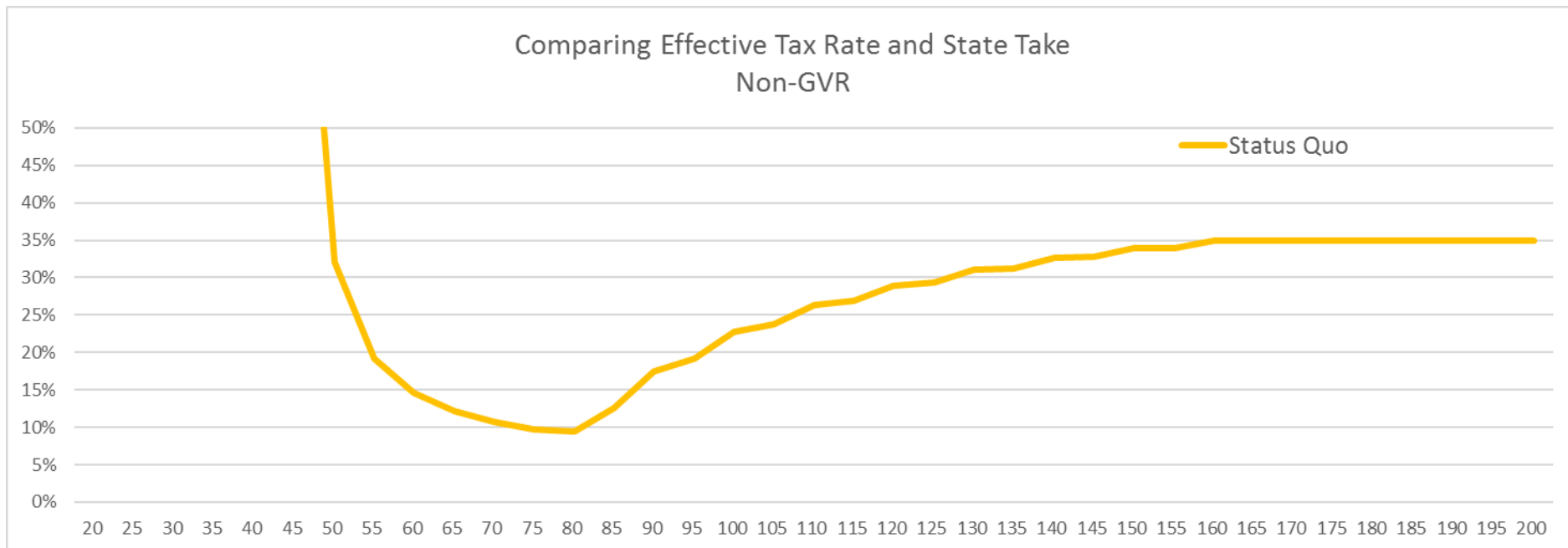


Chart Components

- The blue line represents the change in effective tax rate created based on the inputs changed in the yellow cells of the model
 - In this case, the per barrel start price was lowered from \$80/bbl to \$60/bbl

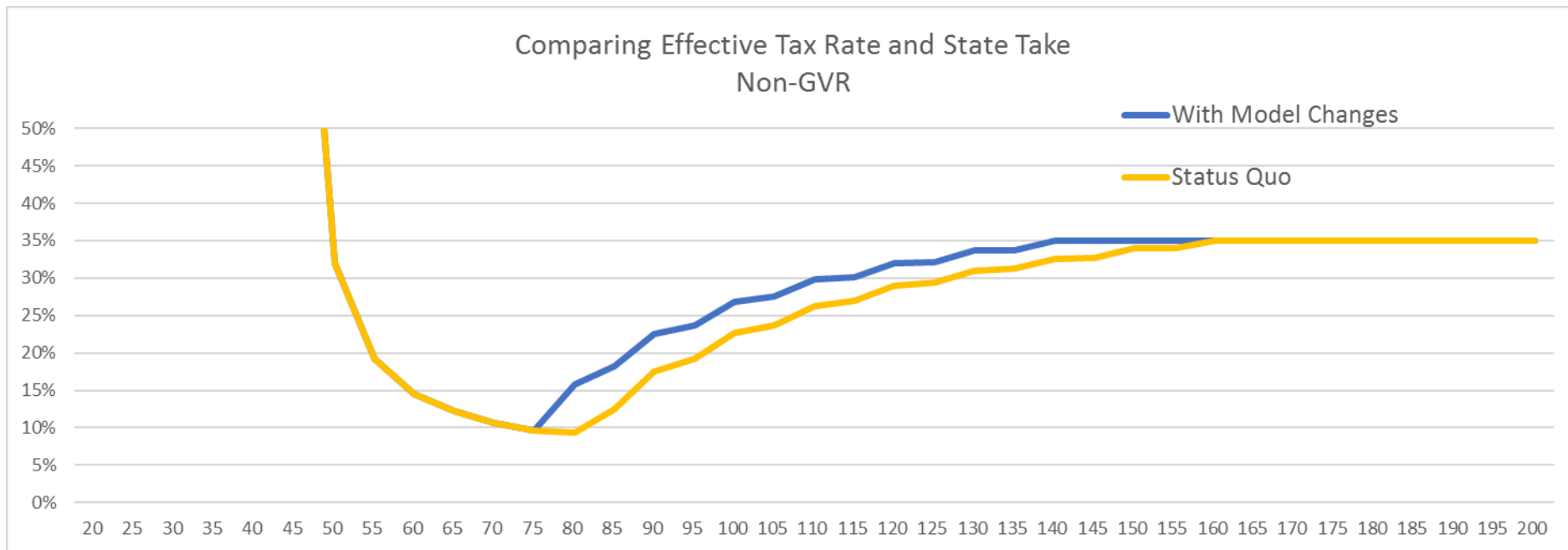
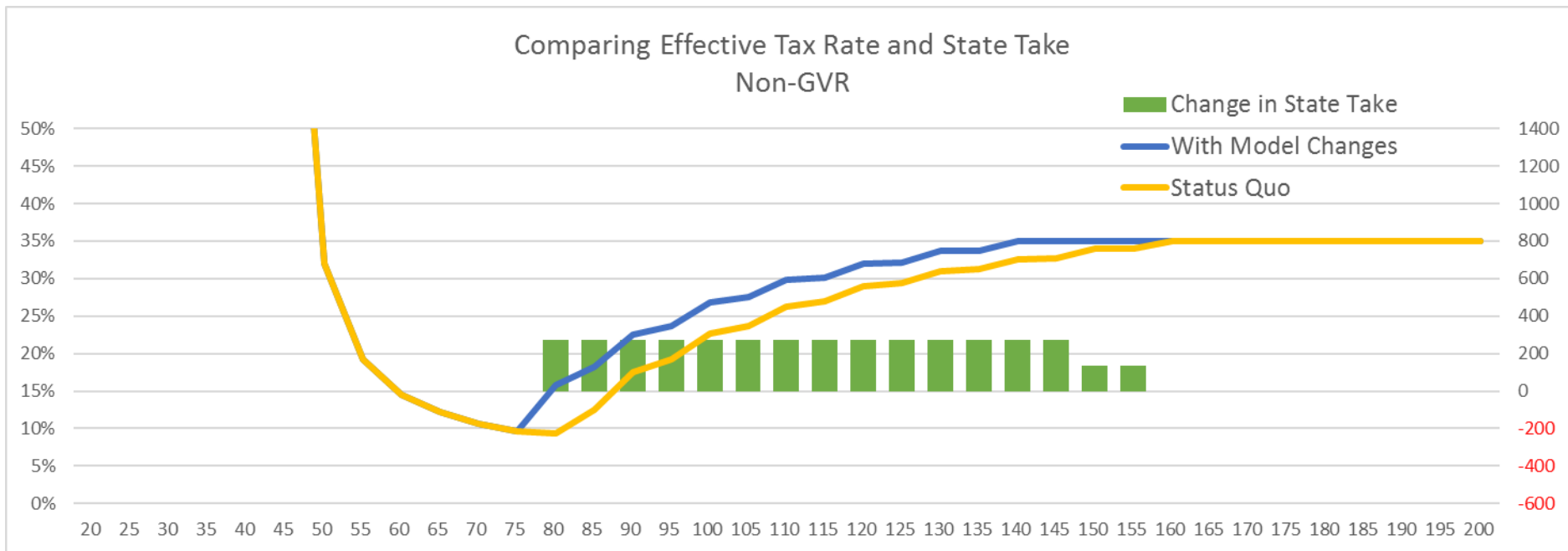


Chart Components

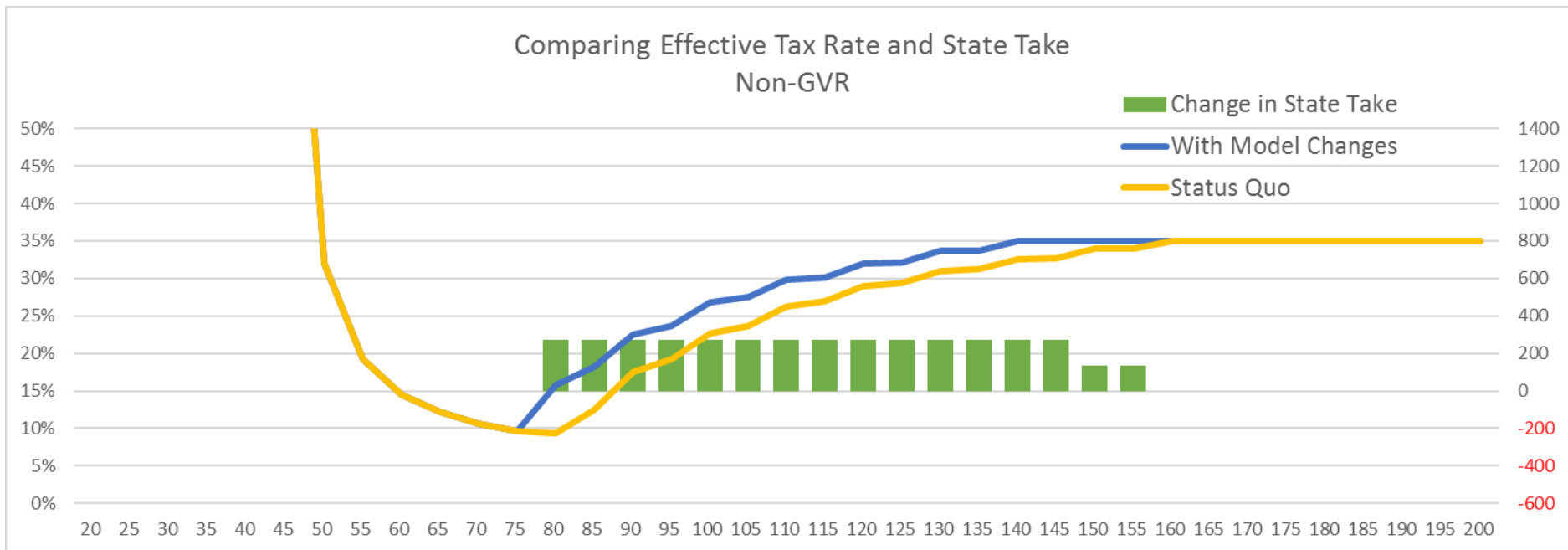
3 The green bars are the change in revenue to the state at a given price point

- Mathematically, they represent the dollar value of the change between the orange and blue lines at that price point



Reading the Chart

- At \$85/bbl price you can see:
 - CSHB111 (orange line) tax rate @ \$85/bbl is 13%
 - With Model Changes (blue line) tax rate @ \$85/bbl is now 18%
 - The 5% difference in effective tax rate paid creates \$269 change in revenue (green bars) to the state

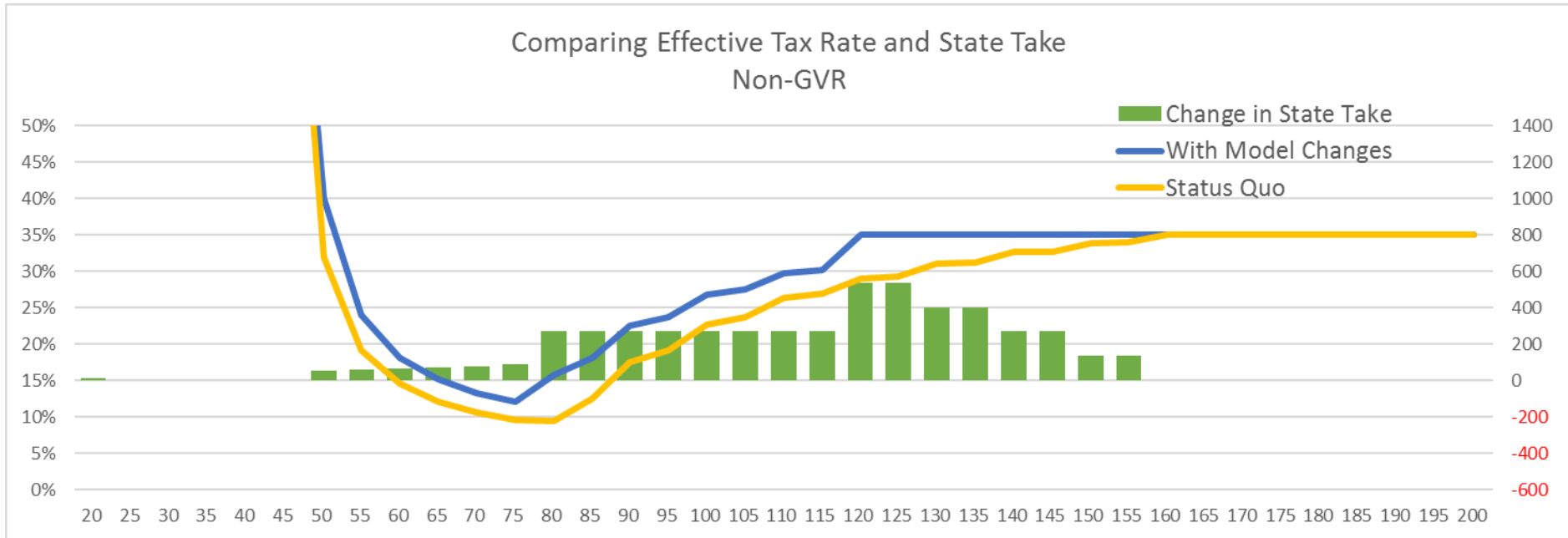


Example Analysis

StatusQuo vs. CSHB111

Non-GVR fields

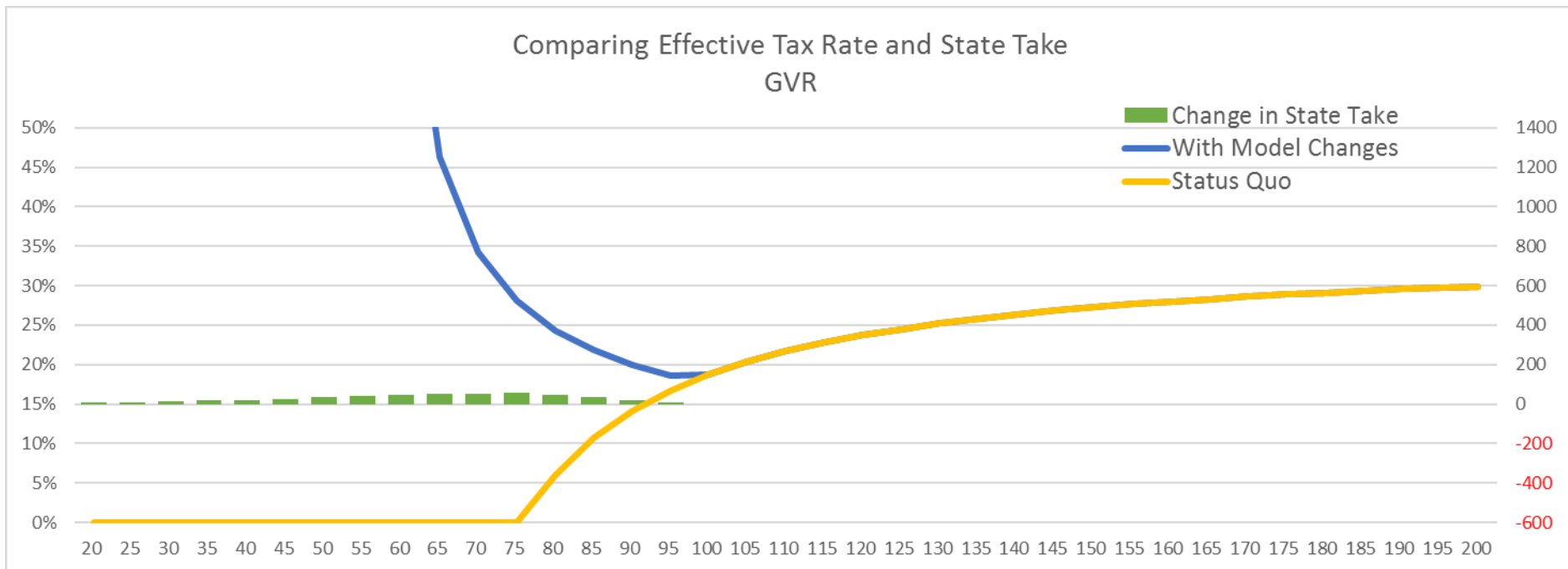
- In Non-GVR fields, CSHB111 will result in an increase of state take at price points between \$50/bbl and \$155/bbl



StatusQuo vs. CSHB111

GVR fields

- In GVR fields, CSHB111 will result in an increase of state take where the hard floor takes effect, price points below \$100/bbl



StatusQuo Example: Single Input Change, Per Barrel Credit

- To create a scenario of StatusQuo with change in per barrel credit structure:
 - Use the StatusQuo worksheet
 - In the per barrel credits table, make the following changes
 - Start price: \$60
 - Min Credit: \$3
 - With the changes made, the table should now look like the one below on the right

StatusQuo

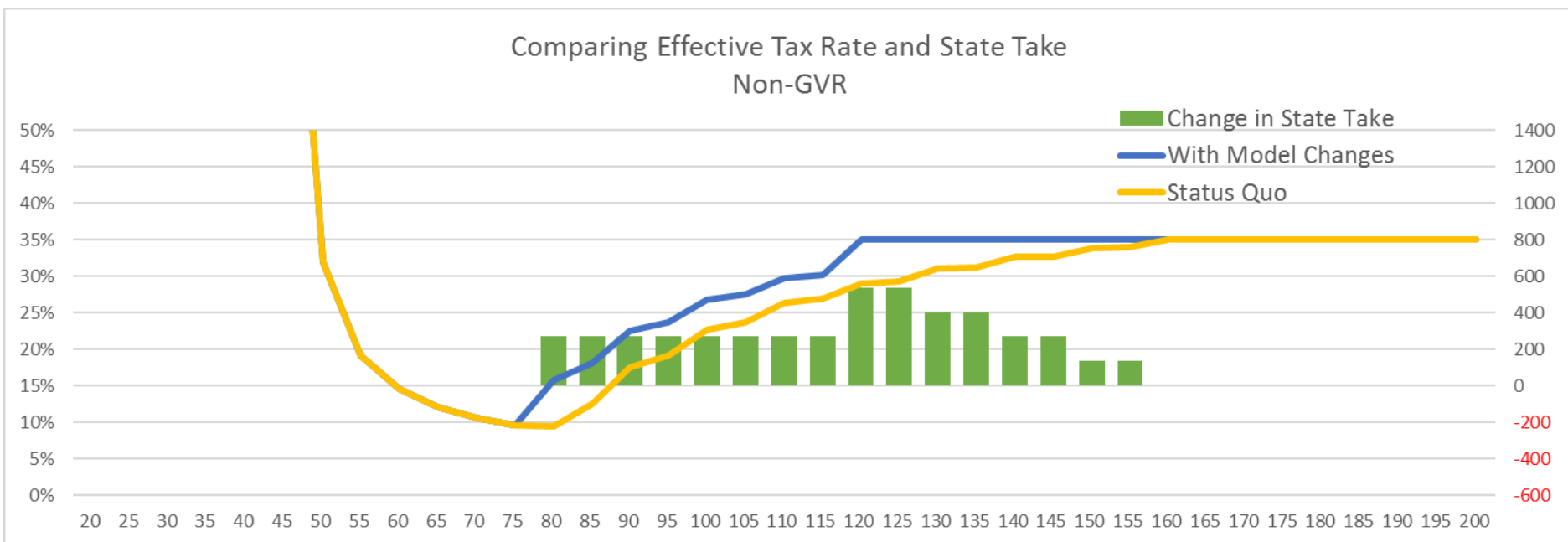
Per Barrel Credits	
Start Price	80.00
Price Step	10.00
Max Credit	8.00
Credit Step	1.00
Min Credit	0.00

With Inputs Changes

Per Barrel Credits	
Start Price	60.00
Price Step	10.00
Max Credit	8.00
Credit Step	1.00
Min Credit	3.00

StatusQuo Example: Single Input Change, Per Barrel Credit

- Changing just the per barrel credit structure yields the differences below:
 - The **state take** increases at all prices between \$80-\$155/bbl
 - The largest difference is at \$120/bbl where the per barrel credit ends at \$3/bbl
 - The **StatusQuo** doesn't reach 35% effective tax rate until prices above \$160/bbl, but the **new effective tax rate curve** reaches the 35% effective tax rate at \$120/bbl



StatusQuo Example: Single Input Change, Minimum Tax

- To create a scenario of StatusQuo with change in minimum tax structure:
 - Use the StatusQuo worksheet
 - In the minimum tax table, make the following changes
 - Step 6 Start Price: \$50 @ 5%
 - Step 7 Start Price: \$60 @ 6%
 - With the changes made, the table should now look like the one below on the right

StatusQuo

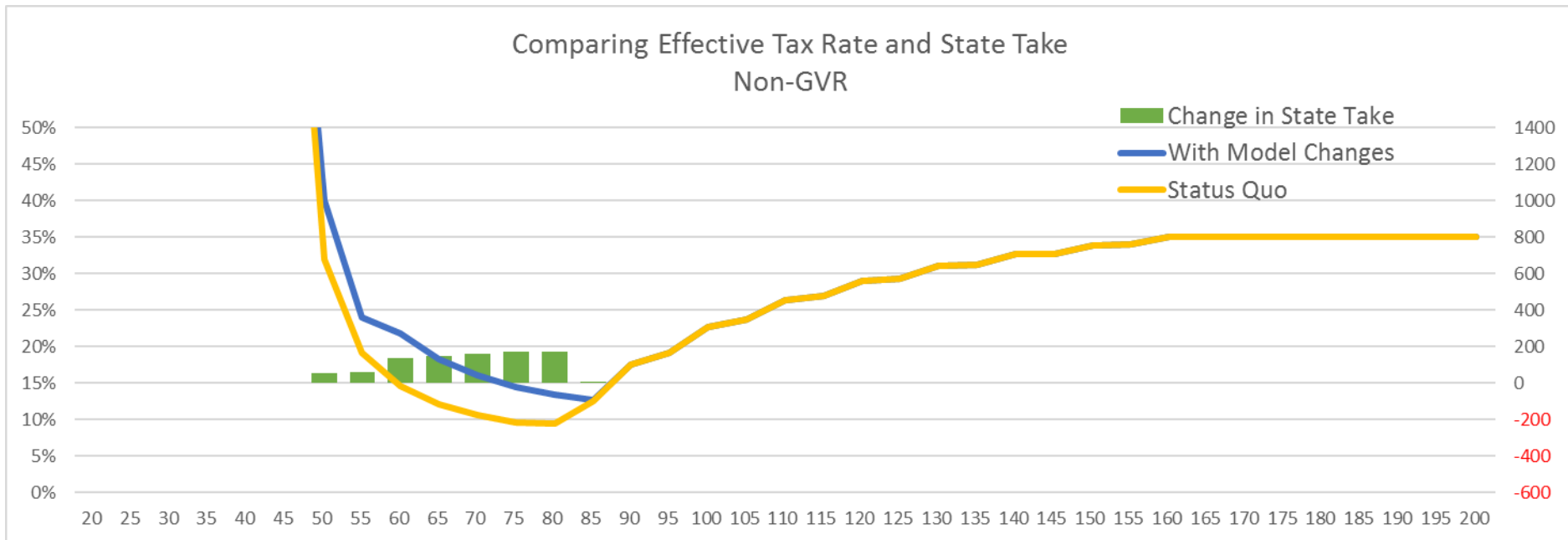
Minimum Gross Tax				
Step	ANSWC min	ANSWC max	Rate	
1	0.00	14.99	0%	
2	15.00	17.49	1%	
3	17.50	19.99	2%	
4	20.00	24.99	3%	
5	25.00		4%	
6			5%	
7			6%	
8			7%	
9			8%	
10			9%	

With Inputs Changes

Minimum Gross Tax				
Step	ANSWC min	ANSWC max	Rate	
1	0.00	14.99	0%	
2	15.00	17.49	1%	
3	17.50	19.99	2%	
4	20.00	24.99	3%	
5	25.00	49.99	4%	
6	50.00	59.99	5%	
7	60.00		6%	
8			7%	
9			8%	
10			9%	

StatusQuo Example: Single Input Change, Minimum Tax

- Changing just the minimum tax structure yields the differences below:
 - The **state take** increases at all prices between \$50-\$80/bbl, where the extra minimum tax steps were added with increased %
 - At \$85/bbl **StatusQuo** and the **new effective tax rate curve** both are subject to paying higher than the minimum tax, thus the lines are equal above \$85/bbl



CSHB111 Example: Single Input Change, Minimum Tax

- To create a scenario of CSHB111 with added steps above 5% in minimum tax structure:
 - Use the CSHB111 worksheet
 - In the minimum tax table, make the following changes
 - Step 3: \$55 @ 6%
 - Step 4: \$60 @ 7%
 - Step 5: \$65 @ 8%
 - With the changes made, the table should now look like the one on the right

CSHB111

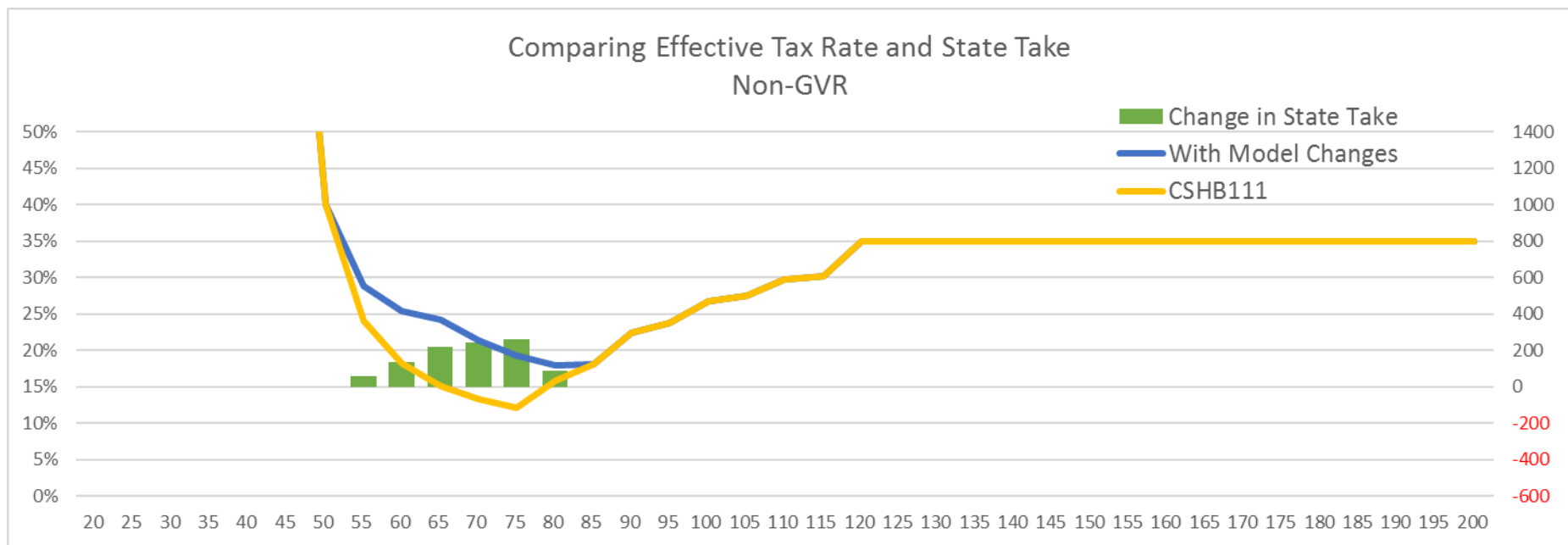
Minimum Gross Tax			
Step	ANSWC min	ANSWC max	Rate
1	0.00	49.99	4%
2	50.00		5%
3			
4			
5			
6			
7			
8			
9			
10			

With Inputs Changes

Minimum Gross Tax			
Step	ANSWC min	ANSWC max	Rate
1	0.00	49.99	4%
2	50.00	54.99	5%
3	55.00	59.99	6%
4	60.00	64.99	7%
5	65.00		8%
6			
7			
8			
9			
10			

CSHB111 Example: Single Input Change, Minimum Tax

- Changing just the minimum tax structure yields the differences below:
 - The **state take** increases at all prices between \$55-\$80/bbl
 - The addition of minimum tax steps above \$50 results in higher state take until the tax paid exceeds the minimum tax @ \$85/bbl
 - The **StatusQuo** effective tax rate switches from minimum to net at \$75/bbl
 - The **new effective tax rate curve** to a net tax rate at \$85/bbl, resulting in additional revenue to the state at the higher minimum rates



Example # 1: New Scenario

- Baseline Comparison: StatusQuo
- Scenario: Compare StatusQuo with new scenario of
 - Hard Floor: Yes Hard Floor Yes
 - Minimum Tax of 5% above \$30/bbl
 - Per barrel credit start price: \$60/bbl
 - Per barrel credit minimum: \$3/bbl

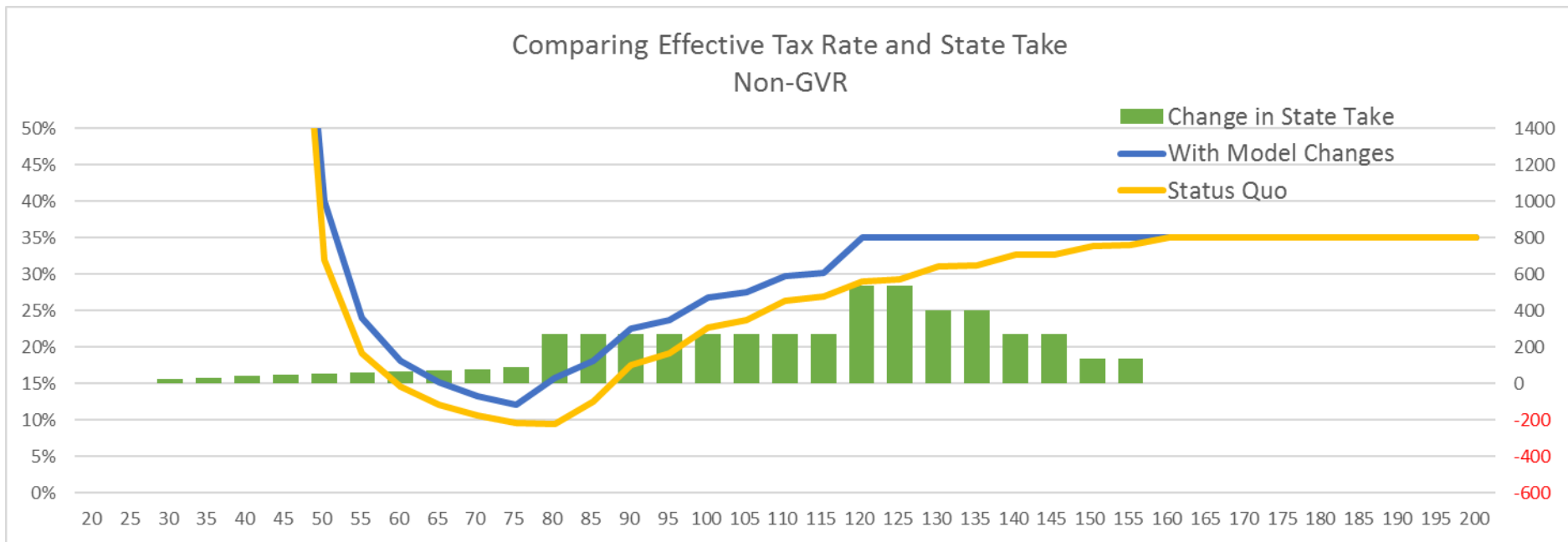
Minimum Gross Tax			
Step	ANSWC min	ANSWC max	Rate
1	0.00	14.99	0%
2	15.00	17.49	1%
3	17.50	19.99	2%
4	20.00	24.99	3%
5	25.00	29.99	4%
6	30		5%

Per Barrel Credits	
Start Price	60.00
Price Step	10.00
Max Credit	8.00
Credit Step	1.00
Min Credit	3.00

These changes should be made on the "StatusQuo" worksheet

Example # 1: New Scenario

- The new effective tax rate curve (blue line) results in higher taxes paid at all price points between \$30 and \$160/bbl
 - The greatest difference is @ \$120/bbl and \$125/bbl where the **Status Quo** effective tax rate is 29%, but the **new tax rate** is 35%. This change results in additional **\$539 million** to the state



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CASTLE**GAP**



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