Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung

Natural Capital Declaration
Financial sector leadership on natural capital

Secretariat:
UNEP FINANCE INITIATIVE
GCP GLOBAL CANOPY PROGRAMME
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EMERGING MARKETS DIALOGUE ON FINANCE

Pilot Project on Environmental Stress Testing
UNEP FI Global Round Table 2016

Yannick Motz, Emerging Markets Dialogue on Green Finance

26th October 2016

Folsom Lake, California, 2004

Folsom Lake, California, 2014

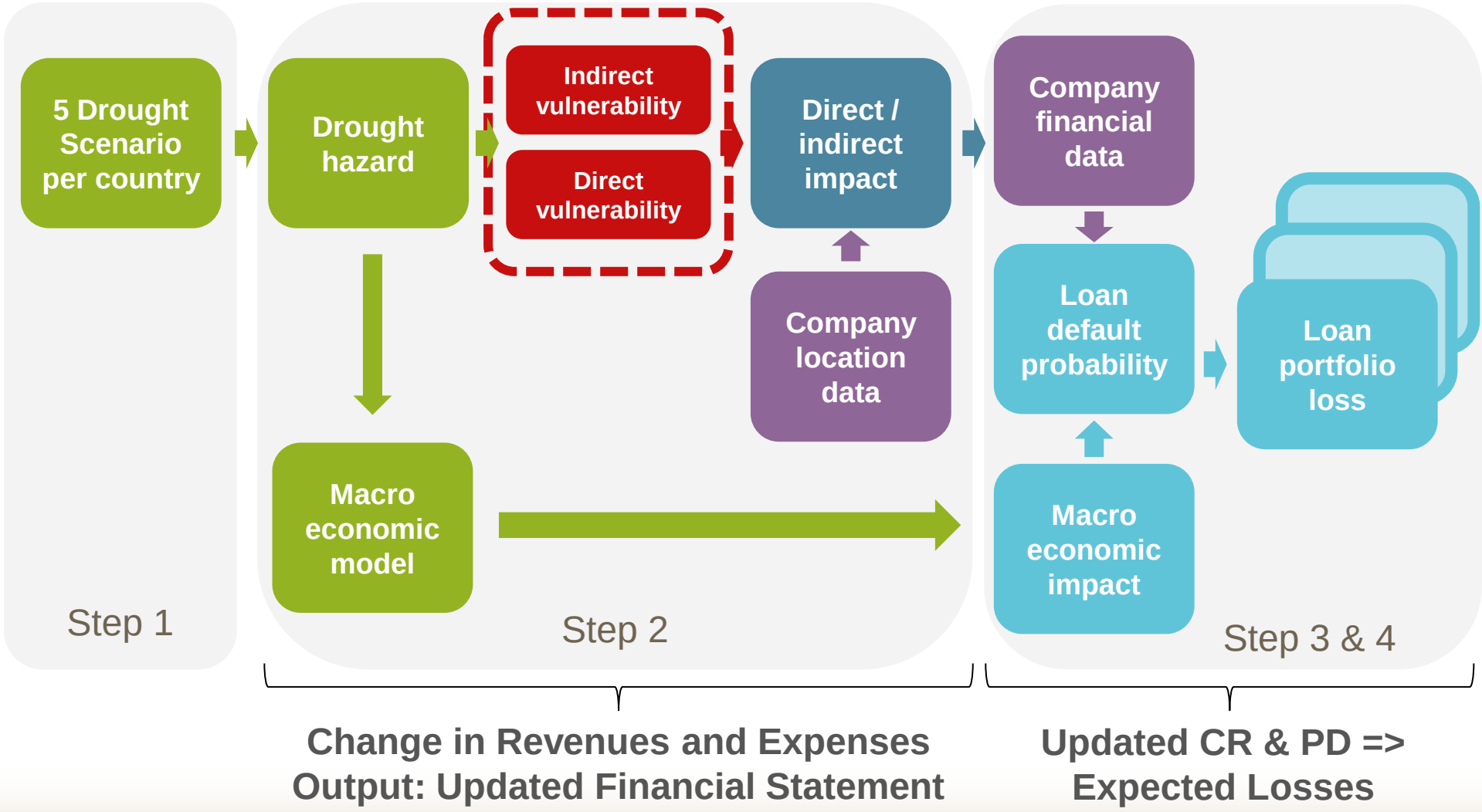
Goals of Pilot Project *Environmental Stress Testing*

Integration of environmental indicators into financial decision-making processes of banks

Develop and test analytical framework and model that allows banks to assess the potential impact of droughts on the performance of their corporate lending portfolio.

- **Which loans/companies and sectors are particularly susceptible to drought conditions?**
- **Appropriate interest rate for a loan given to a company operating in a water stressed area?**
- **What are potential capital requirements caused by a drought?**

Components of the Tool



Change in Revenues and Expenses
Output: Updated Financial Statement

Updated CR & PD => Expected Losses

Partner Structure

Implementation Partners	RMS, University of Cambridge, University of Oxford
Expert Council	Mercer, MSCI, Standard & Poor's Ratings Services (McGraw Hill Financial), Central University of Finance and Economics Library, UCL, Inquiry: Design of a Sustainable Financial System, Bloomberg, Resources for the Future
Partner Banks	Santander, Banamex, Citi, UBS, Itaú, Caixa Econômica Federal, ICBC, FIRA, Banorte

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Thank you for your kind attention.

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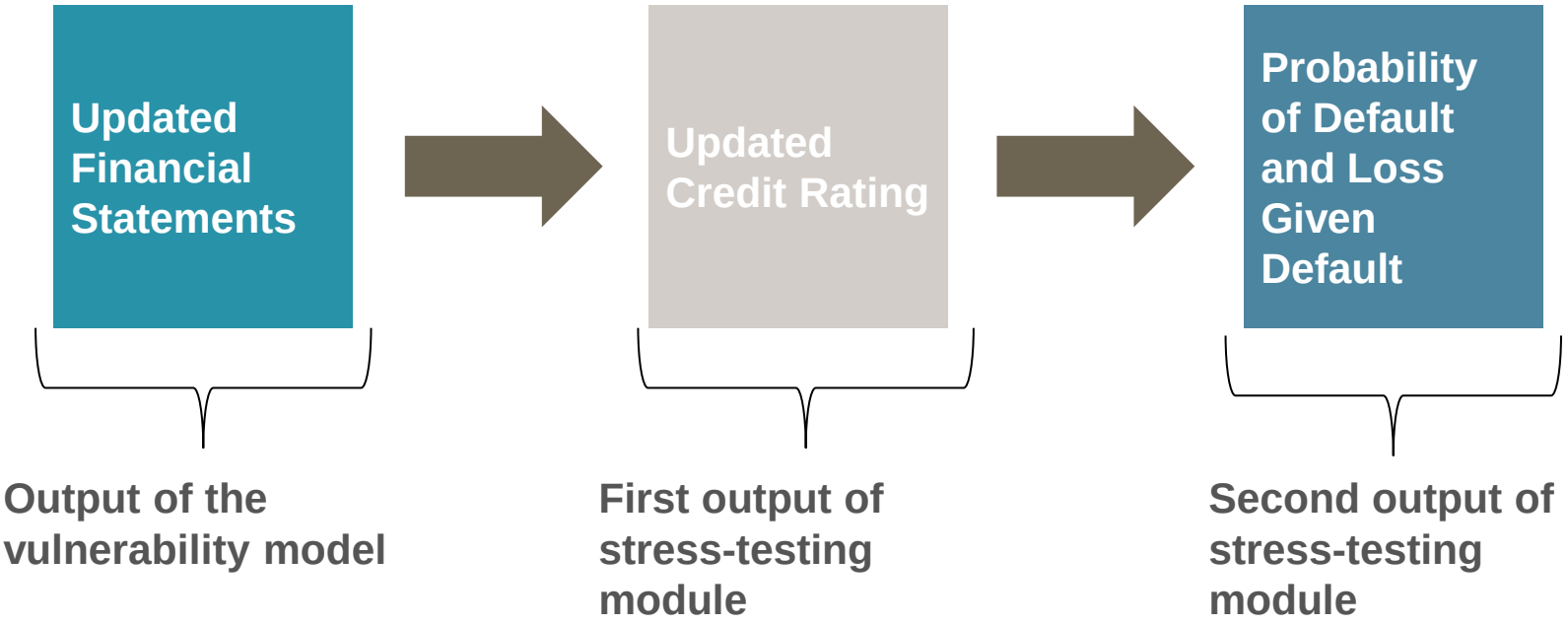
Appendix

Expected Loss Calculation

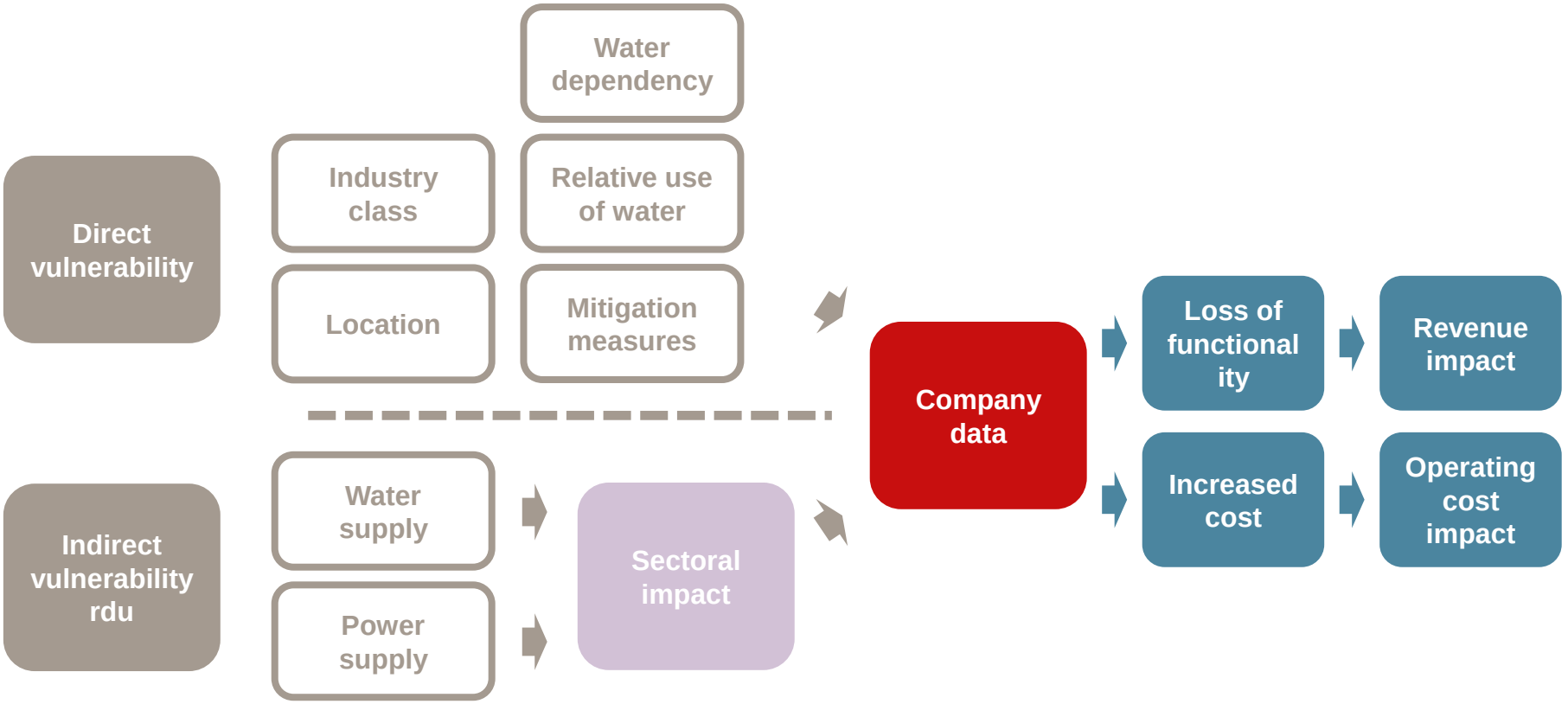
We have:

$$EL_t = DP_t \times exp_t \times LGD_t$$

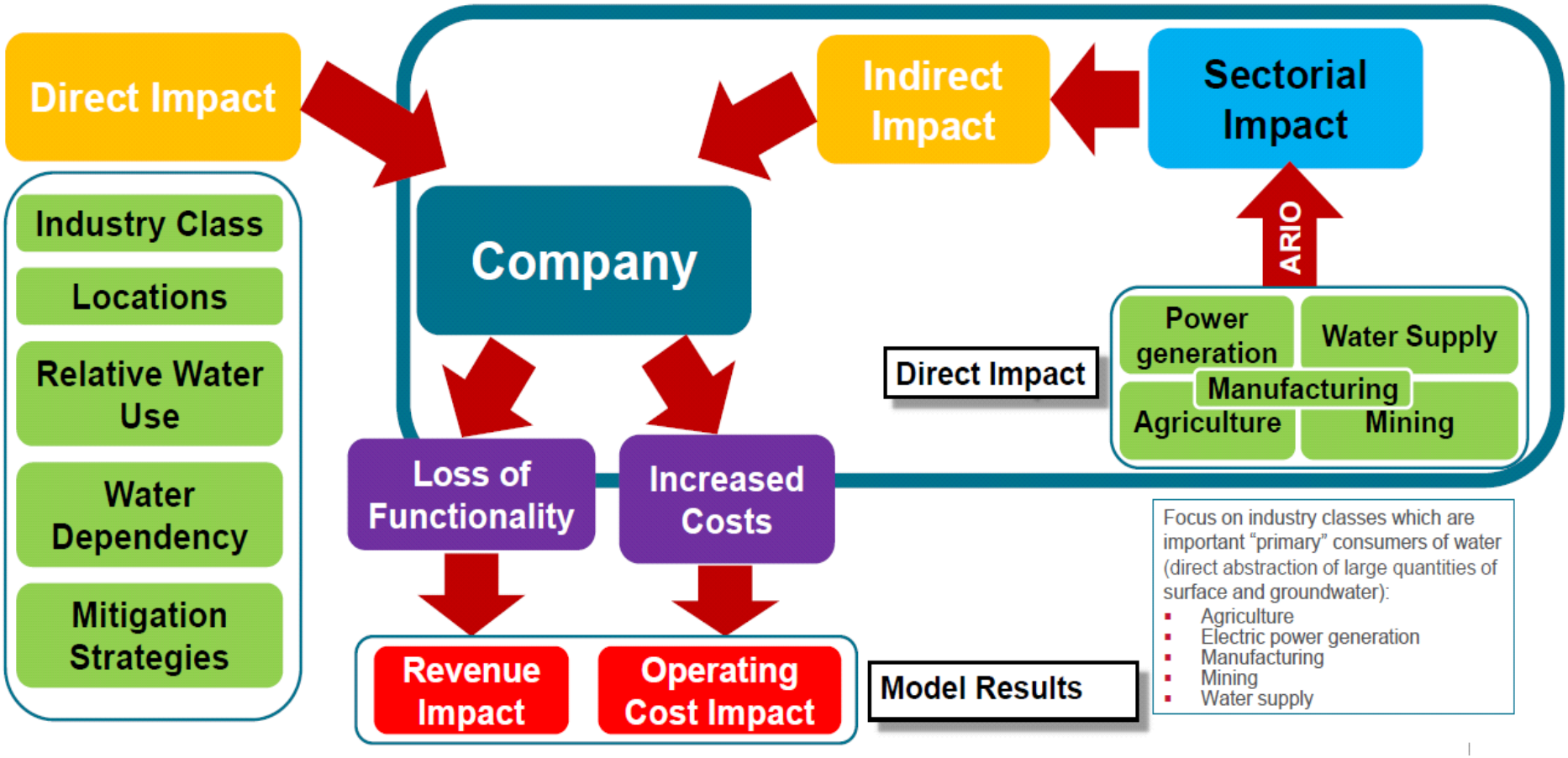
Given that we will know the exposure, we need to find the default probability and the loss given default.



Vulnerability Model



DROUGHT IMPACT MODELLING – HIGH-LEVEL FRAMEWORK



Calculate Expected Losses

Calculation Currency: USD

Calculation Assumptions: Both Financial Statement and Macroeconomic

Absolute Differences

U.S. Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -7,207	$ 118,134	$ 447,218	$ -4,496	$ -166,302	$ 387,346
Scenario 2	$ 475,317	$ 227,219	$ 330,946	$ -31,405	$ -118,781	$ 883,296
Scenario 3	$ 121,710	$ 160,813	$ 137,071	$ 124,938	$ 12,995	$ 557,527
Scenario 4	$ 243,358	$ -34,874	$ 12,029	$ 8,908	$ 3,743	$ 233,164
Scenario 5	$ 181,708	$ 50,394	$ -17,377	$ 8,315	$ 2,171	$ 225,210

Brazil Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 2	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 3	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 4	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 5	$ -	$ -	$ -	$ -	$ -	$ -

Mexico Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 2	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 3	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 4	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 5	$ -	$ -	$ -	$ -	$ -	$ -

China Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 2	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 3	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 4	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 5	$ -	$ -	$ -	$ -	$ -	$ -

Absolute Losses

U.S. Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ 604,174	$ 547,164	$ 570,940	$ 590,973	$ 566,205	$ 2,879,456
Scenario 1	$ 596,966	$ 665,298	$ 1,018,157	$ 586,477	$ 399,903	$ 3,266,802
Scenario 2	$ 1,079,491	$ 774,382	$ 901,886	$ 559,568	$ 447,425	$ 3,762,752
Scenario 3	$ 725,884	$ 707,977	$ 708,011	$ 715,911	$ 579,200	$ 3,436,983
Scenario 4	$ 847,532	$ 512,289	$ 582,969	$ 599,881	$ 569,949	$ 3,112,619
Scenario 5	$ 785,881	$ 597,558	$ 553,563	$ 599,288	$ 568,376	$ 3,104,666

Brazil Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 2	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 3	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 4	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 5	$ -	$ -	$ -	$ -	$ -	$ -

Mexico Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 2	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 3	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 4	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 5	$ -	$ -	$ -	$ -	$ -	$ -

China Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 1	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 2	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 3	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 4	$ -	$ -	$ -	$ -	$ -	$ -
Scenario 5	$ -	$ -	$ -	$ -	$ -	$ -

Percentage of Gross Exposure Differences

U.S. Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Scenario 1	-0.03%	0.49%	1.86%	-0.02%	-0.69%	1.61%
Scenario 2	1.98%	0.95%	1.38%	-0.13%	-0.49%	3.68%
Scenario 3	0.51%	0.67%	0.57%	0.52%	0.05%	2.32%
Scenario 4	1.01%	-0.15%	0.05%	0.04%	0.02%	0.97%
Scenario 5	0.76%	0.21%	-0.07%	0.03%	0.01%	0.94%

Brazil Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Percentage of Gross Exposure

U.S. Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	2.52%	2.28%	2.38%	2.46%	2.36%	12.00%
Scenario 1	2.49%	2.77%	4.24%	2.44%	1.67%	13.61%
Scenario 2	4.50%	3.23%	3.76%	2.33%	1.86%	15.68%
Scenario 3	3.02%	2.95%	2.95%	2.98%	2.41%	14.32%
Scenario 4	3.53%	2.13%	2.43%	2.50%	2.37%	12.97%
Scenario 5	3.27%	2.49%	2.31%	2.50%	2.37%	12.94%

Brazil Analyses

Scenario Number	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Reference Scenario	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%