Supporting Information

Integrated approach of Safety, Sustainability, Reliability, and Resilience Analysis via a Return on Investment Metric

[1,2]Kariana Moreno-Sader[#], [1,3,4]Prerna Jain[*#], [5]Luis Carlos Ballestas Tenorio, [1,4]M. Sam Mannan, [1,3,4]Mahmoud M. El-Halwagi

[1]Mary Kay O'Connor Process Safety Center
[2]Department of Chemical Engineering, University of Cartagena, Colombia
[3]Texas A&M Energy Institute
[4]Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX778433122, USA
[5]Ecopetrol SA (Columbian Petroleum Company)

[#]Both authors contributed equally to this manuscript
[*]Corresponding author email: prerna.jain@aggienetwork.com

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%Matlab code for selected case study

%Project 1

w=[0.125 0.0625 0.0625 0.3125 0.3125 0.0625 0.0625; 0.243031 0.2465157
0.24477352 0.26567944 0 0 0; 1 0 0 0 0 0 0; 1 0 0 0 0 0 0];%This is the matrix
for weight factors
Wc=[0.5; 0.9; 0.6; 0.8];%This is the matrix for each indicator type
IMb=[0 0 0 0 0 0 0; 2 0.43 0.3 3 0 0 0; 3.875968992 0 0 0 0 0 0; 1133 0 0 0 0 0
0]; %This is the matrix of indicators for the base case
IMp1=[-0.16849 -0.04605575  -0.00557107 -0.01917898 -50.9376414 -
0.19598931 -0.00036524; 1 0.1 0.2 1 0 0 0; 3.875968992 0 0 0 0 0 0; 1095 0 0 0
0 0 0];%This is the matrix of indicators for the project
IMt=[3 0.82003243 0.09919415 0.34148581 906.955452 3.48963105
0.00650319; 0 0.05 0.05 0 0 0 0; 5.7 0 0 0 0 0 0; 450 0 0 0 0 0 0]; %This is the
matrix of indicator for target
AEP1=9891890.33; %This is the annual economic profit
TCI1=63323659.80; %This is the total capital investment

M1=w.*Wc.*((IMb-IMp1)./(IMb-IMt)); %Matrix of calculus
M1(isnan(M1))=0; %this operation remove the NaN obtained dividing by 0
SumM1=sum(M1);%Sum all the values in a column
Totalsum1=sum(SumM1);%sum the entire row
S2R2WROIM1=AEP1*(1+Totalsum1)/TCI1;%This is the desired value

%Project 2

IMp2=[-0.83338 -0.22779954 -0.02755547 -0.09486248 -251.946178 -
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0.96939624 -0.00180654; 1 0.21 0.1 1 0 0 0; 5.813953488 0 0 0 0 0 0; 1098 0 0
0 0 0 0];%This is the matrix of indicators for the project
AEP2=8937554.52; %This is the annual economic profit
TCI2=70071507.90; %This is the total capital investment
M2= w.*Wc.*((IMb-IMp2)./(IMb-IMt)); %Matrix of calculus
M2(isnan(M2))=0; %this operation remove the NaN obtained dividing by 0
SumM2=sum(M2);%Sum all the values in a column
Totalsum2=sum(SumM2);%sum the entire row
S2R2WROIM2=AEP2*(1+Totalsum2)/TCI2;%This is the desired value

%Project 3

IMp3=[-0.96905 -0.26488414 -0.03204136 -0.11030561 -292.961727 -
1.12720899 -0.00210064; 3 0.89 0.4 1 0 0 0; 5.813953488 0 0 0 0 0 0; 1095 0 0
0 0 0 0];%This is the matrix of indicators for the project
AEP3=8786341.54; %This is the annual economic profit
TCI3=70948304.70; %This is the total capital investment
M3= w.*Wc.*((IMb-IMp3)./(IMb-IMt)); %Matrix of calculus
M3(isnan(M3))=0; %this operation remove the NaN obtained dividing by 0
SumM3=sum(M3);%Sum all the values in a column
Totalsum3=sum(SumM3);%sum the entire row
S2R2WROIM3=AEP3*(1+Totalsum3)/TCI3;%This is the desired value

%Project 4

IMp4=[-0.83331 -0.22778041 -0.02755316 -0.09485451 -251.925016 -
0.96931482 -0.00180639; 2 0.54 0.15 2 0 0 0; 8.720930233 0 0 0 0 0 0; 1098 0 0
0 0 0 0];%This is the matrix of indicators for the project
AEP4=8819620.18; %This is the annual economic profit
TCI4=70600824.15; %This is the total capital investment
M4= w.*Wc.*((IMb-IMp4)./(IMb-IMt)); %Matrix of calculus
M4(isnan(M4))=0; %this operation remove the NaN obtained dividing by 0
SumM4=sum(M4);%Sum all the values in a column
Totalsum4=sum(SumM4);%sum the entire row
S2R2WROIM4=AEP4*(1+Totalsum4)/TCI4;%This is the desired value


%Project 5

IMp5=[-0.98458 -0.26912918 -0.03255486 -0.11207337 -297.656733 -
1.14527365 -0.0021343; 1 0.15 0.1 1 0 0 0; 8.720930233 0 0 0 0 0 0; 1058 0 0 0
0 0 0];%This is the matrix of indicators for the project
AEP5=8685669.88; %This is the annual economic profit
TCI5=71224171.88; %This is the total capital investment
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M5= w.*Wc.*((IMb-IMp5)./(IMb-IMt)); %Matrix of calculus
M5(isnan(M5))=0; %this operation remove the NaN obtained dividing by 0
SumM5=sum(M5);%Sum all the values in a column
Totalsum5=sum(SumM5);%sum the entire row
S2R2WROIM5=AEP5*(1+Totalsum5)/TCI5;%This is the desired value
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