

Simulation From Excel

Innovate Training Session

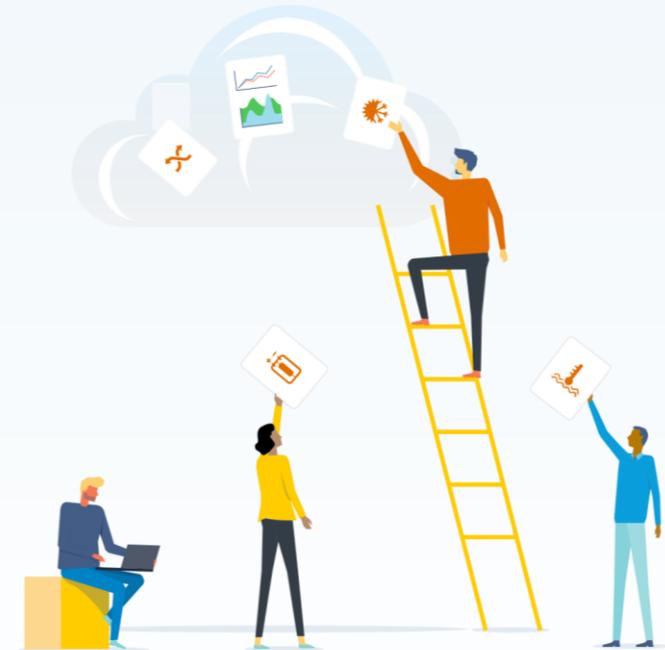
October 11, 2024

Daniel Rohde



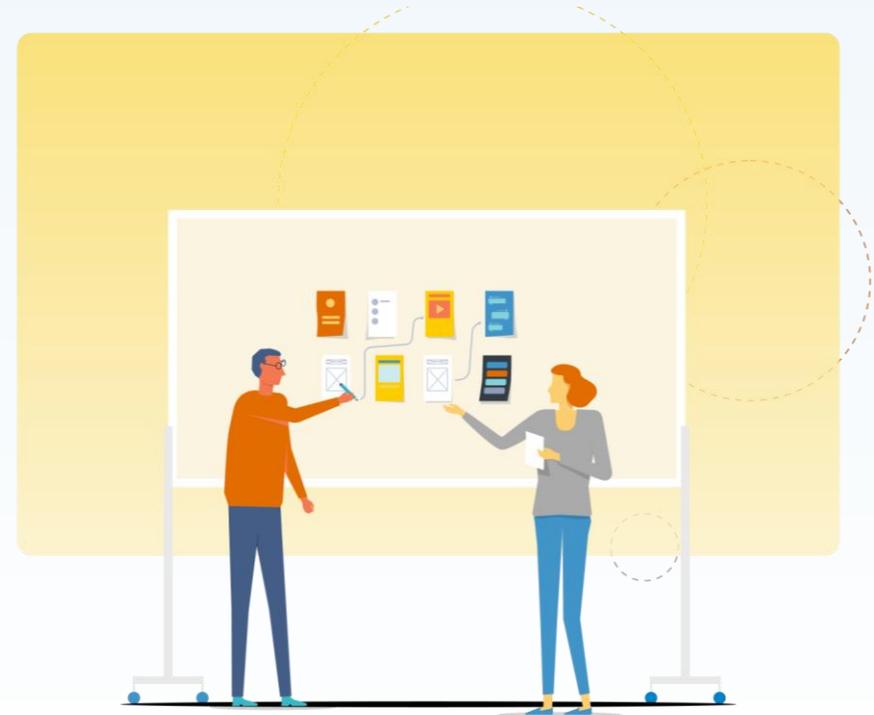
Short Introduction

- Excel Add-in is a relatively new feature
- Development goals
 - Convenient definition of what-if-scenarios (cases)
 - Enabling non-experts to simulate/optimize advanced models



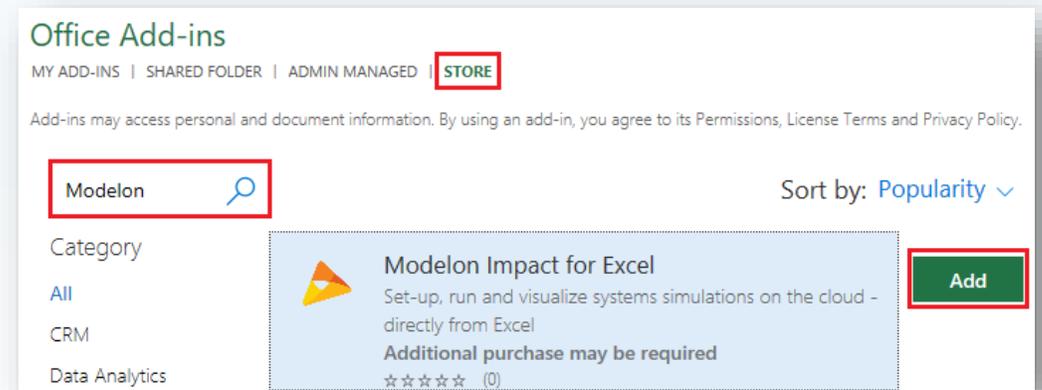
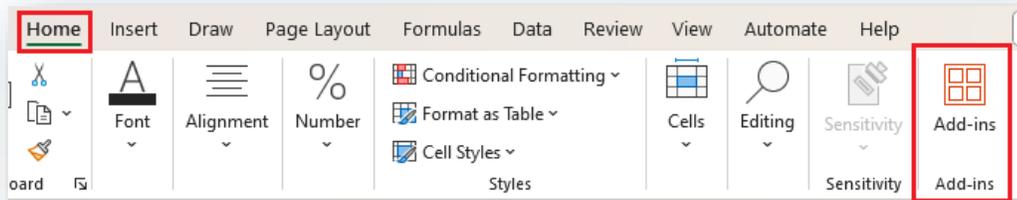
Goals of this Session

- Add-in installed
- Excel file prepared
- Simulations executed
- Result trajectories retrieved



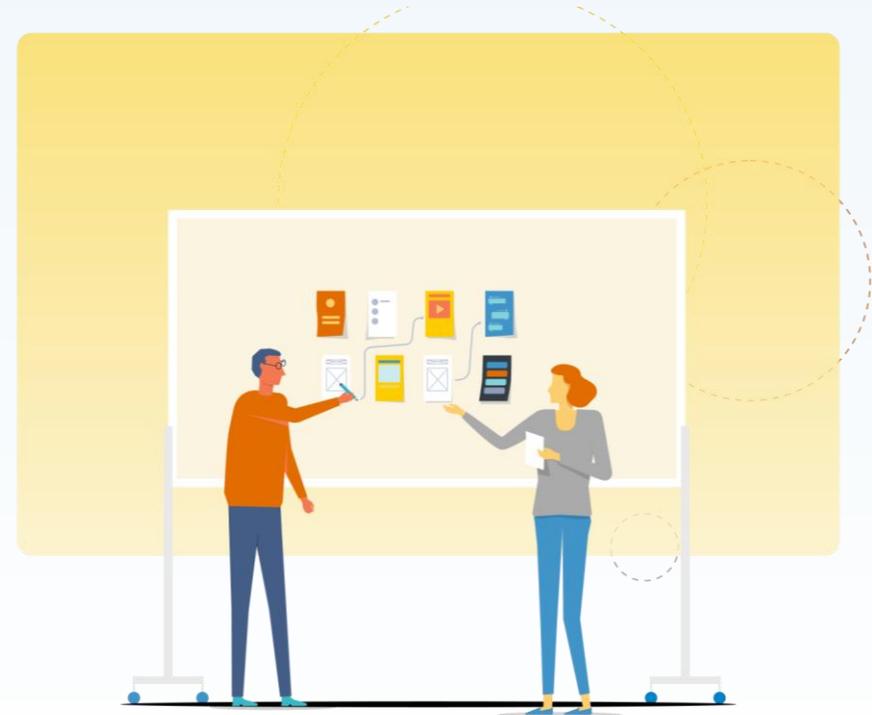
Installing Add-In

1. Open Excel, go to “Home” and “Add-ins”
2. Search for “Modelon” and click “Add” to install
3. Do not sign in to Add-in yet



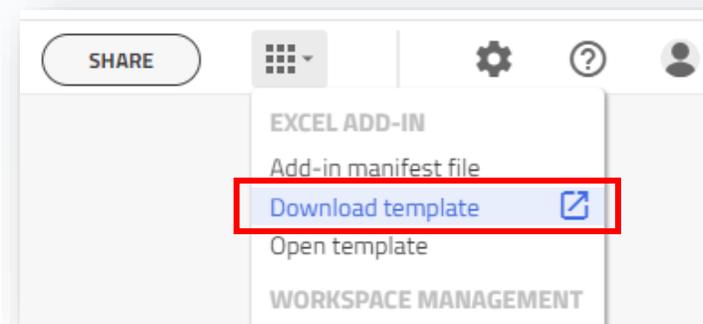
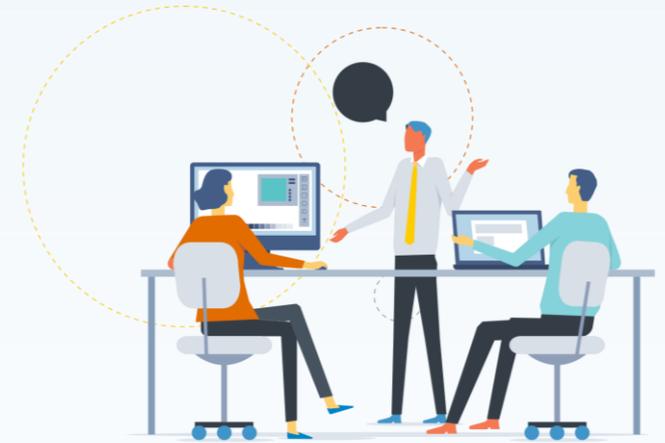
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Preparing Excel File

1. Import workspace “Innovate-SimulationFromExcel”
 - Open Chrome or Edge and go to help.modelon.com
 - Click on Innovate banner
 - Find Excel session and click “Link to workspace”
 - Sign in to Modelon Impact
2. Open model “HeatPump”
3. Simulate model (click play button) and check views (eye symbol)
4. Download Excel template



Preparing Excel File

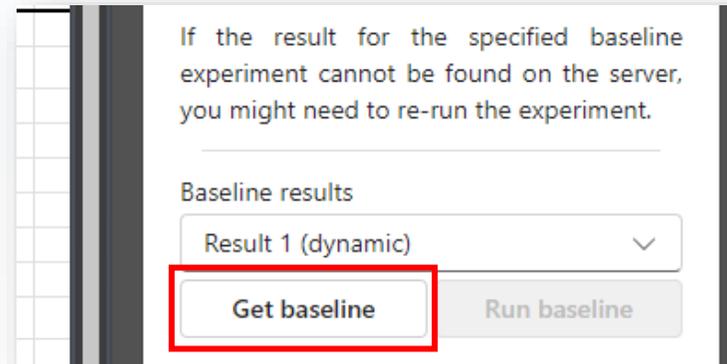
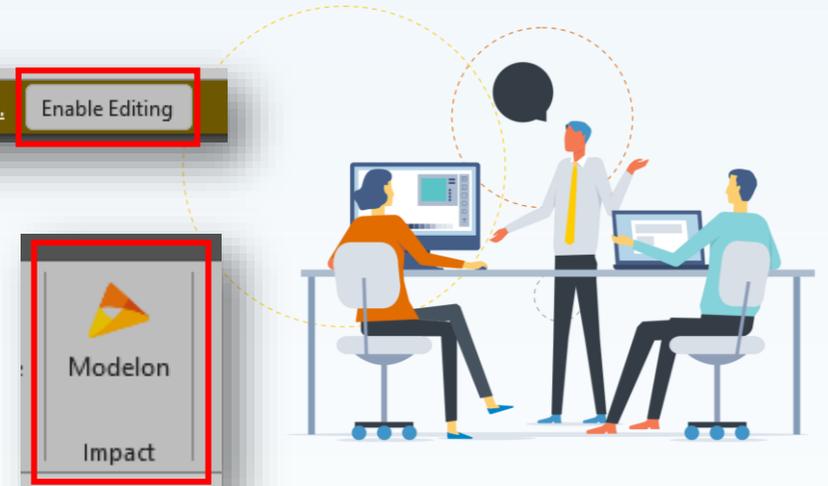
5. Open template in Excel and “Enable Editing”



6. Go to sheet “ModelonExperiment”

7. Sign in to Add-in (same account as workspace!)

8. Get baseline results from “Result 1”



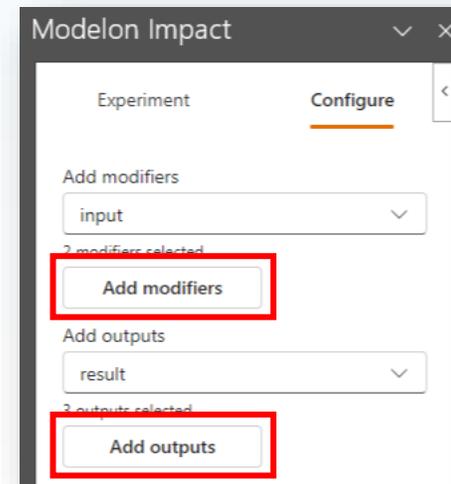
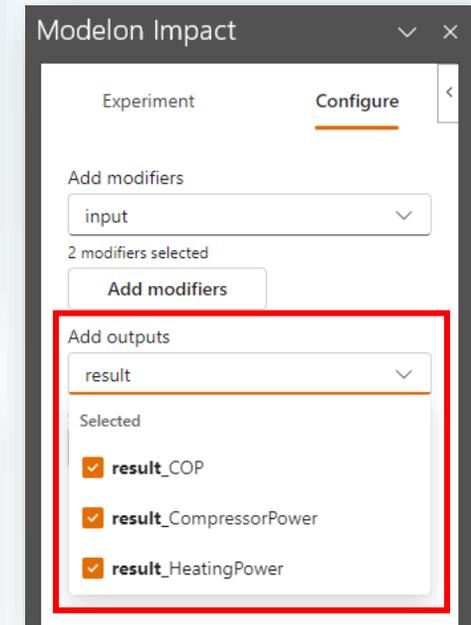
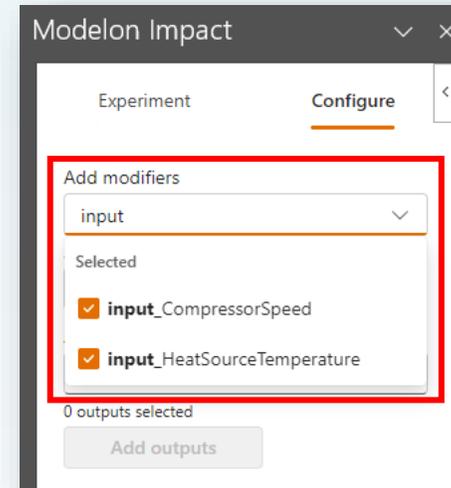
Preparing Excel File

Sheet should look like this now:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Information												
2													
3		Analysis			dynamic								
4		Impact URL			https://impact.modelon.cloud								
5		Experiment template			MI_Template_Standard 1.3.2								
6													
7	Experiment												
8													
9		Model											
10		Workspace ID				innovate-simulationfromexcel							
11		Model name				Models.HeatPump							
12		Baseline experiment ID				models_heatpump_20241007_064613_6c2000c							
13													
14		<i>Advanced settings (unhide hidden rows below to edit)</i>											
28													
29		Analysis settings				Baseline	Case 1	Case 2	Case 3	Case 4	Case 5		
30		start_time				0							
31		final_time				3600							
32													
33		Modifiers	Unit			Baseline	Case 1	Case 2	Case 3	Case 4	Case 5		
34													
35	Results												
36													
37		Outputs	Unit	Trajectory	Baseline	Case 1	Case 2	Case 3	Case 4	Case 5			
38													
39		Experiment information											
40		Status											
41		Failed at											
42		Duration											
43		Datetime finished											
44		Experiment ID											
45		Case ID											
46													

Preparing Excel File

9. Go to “Configure”
10. Type “input” in “Add modifiers” field to filter and check the two listed ones
11. Type “result” in “Add outputs” field to filter and check the three listed ones
12. Click “Add modifiers” and “Add outputs”



Preparing Excel File

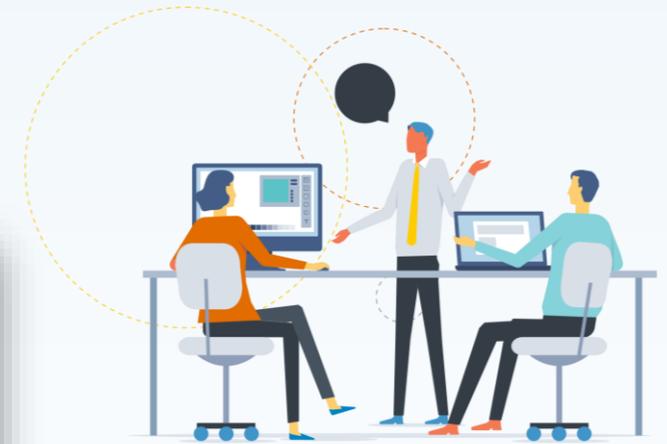
Sheet should look like this now:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Information												
2													
3		Analysis	dynamic										
4		Impact URL	https://impact.modelon.cloud										
5		Experiment template	MI_Template_Standard 1.3.2										
6													
7	Experiment												
8													
9		Model											
10		Workspace ID			innovate-simulationfromexcel								
11		Model name			Models.HeatPump								
12		Baseline experiment ID			models_heatpump_20241007_064613_6c2000c								
13													
14		<i>Advanced settings (unhide hidden rows below to edit)</i>											
15													
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24													
25													
26													
27													
28													
29		Analysis settings			Baseline	Case 1	Case 2	Case 3	Case 4	Case 5			
30		start_time			0								
31		final_time			3600								
32													
33		Modifiers	Unit		Baseline	Case 1	Case 2	Case 3	Case 4	Case 5			
34		input_CompressorSpeed	rad/s		400								
35		input_HeatSourceTemperature	K		288.15								
36													
37	Results												
38													
39		Outputs	Unit	Trajectory	Baseline	Case 1	Case 2	Case 3	Case 4	Case 5			
40		result_COP		NO	3.233857								
41		result_CompressorPower	W	NO	5052760								
42		result_HeatingPower	W	NO	16339905								
43													
44		Experiment information											
45		Status											
46		Failed at											
47		Duration											
48		Datetime finished											
49		Experiment ID											
50		Case ID											
51													

Preparing Excel File

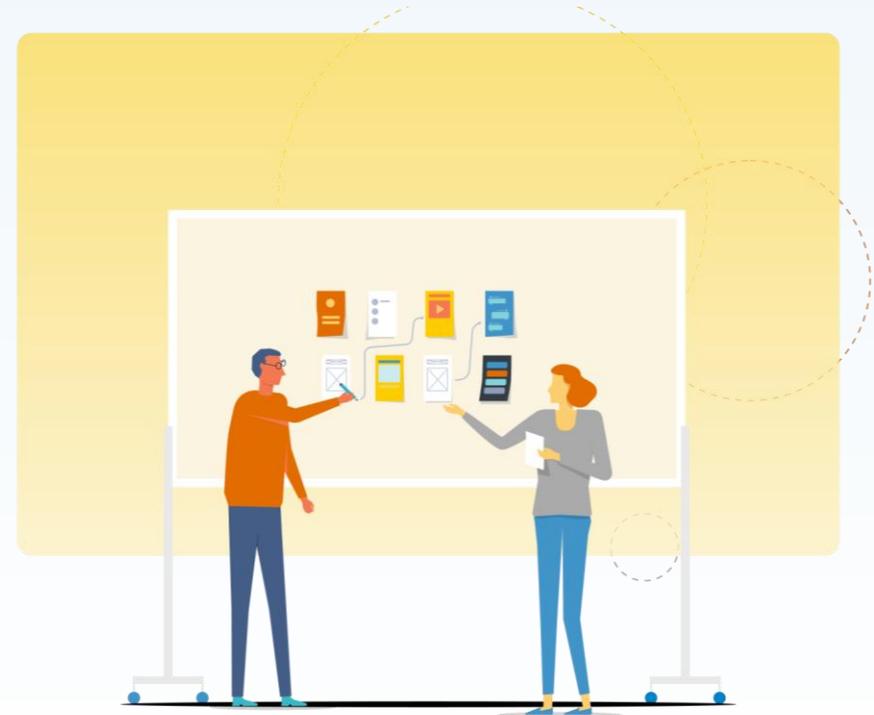
13. Define cases by adding values to all input cells. Suggestion:

Analysis settings		Baseline	Case 1	Case 2	Case 3	Case 4	Case 5
start_time		0	0	0	0	0	0
final_time		3600	3600	3600	3600	3600	3600
Modifiers		Baseline	Case 1	Case 2	Case 3	Case 4	Case 5
Unit							
input_CompressorSpeed	rad/s	400	450	500	400	450	500
input_HeatSourceTemperature	K	288.15	288.15	288.15	283.15	283.15	283.15



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Executing Simulations

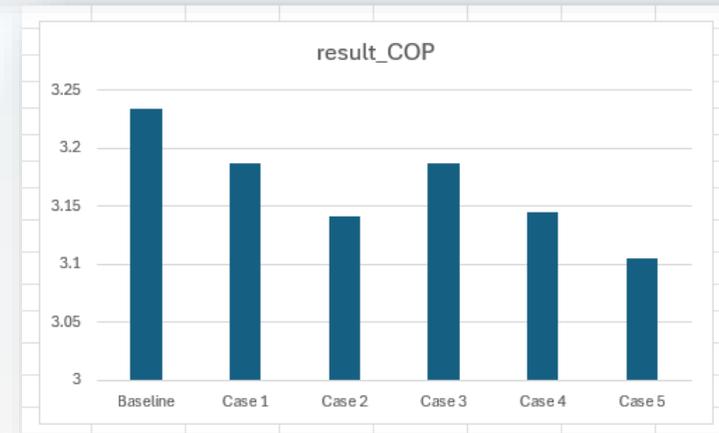
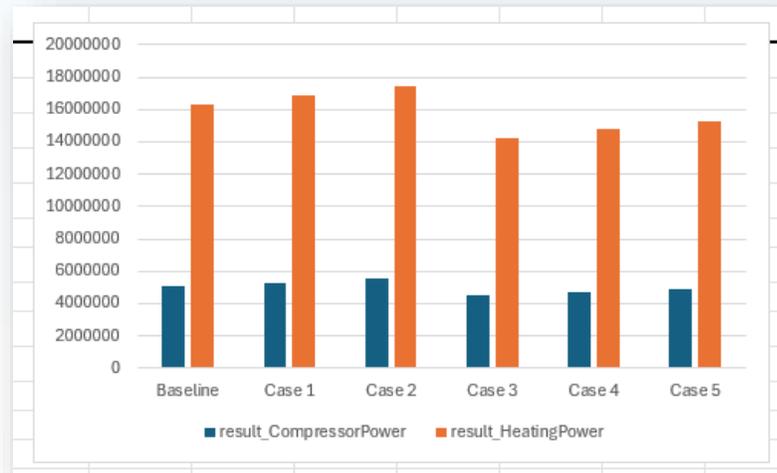
1. Click Add-in play button
2. Check (optionally plot) results
3. Go back to browser and reload page – results will show up there



Results										
Outputs	Unit	Trajectory	Baseline	Case 1	Case 2	Case 3	Case 4	Case 5		
result_COP		NO	3.233857	3.186258	3.141348	3.186527	3.144625	3.104815		
result_CompressorPower	W	NO	5052760	5305096	5552912	4476586	4700323	4919912		
result_HeatingPower	W	NO	16339905	16903406	17443628	14264763	14780755	15275419		
Experiment information										
Status				successful	successful	successful	successful	successful		
Failed at										
Duration				1.2s	1.1s	1.1s	1.1s	1s		
Datetime finished				10/7/2024, 10/7/2024, 10/7/2024, 10/7/2024, 10/7/2024, 9:30:08 AM						
Experiment ID				models_heatpump_20241007_072948_1666931						
Case ID				case_1	case_2	case_3	case_4	case_5		

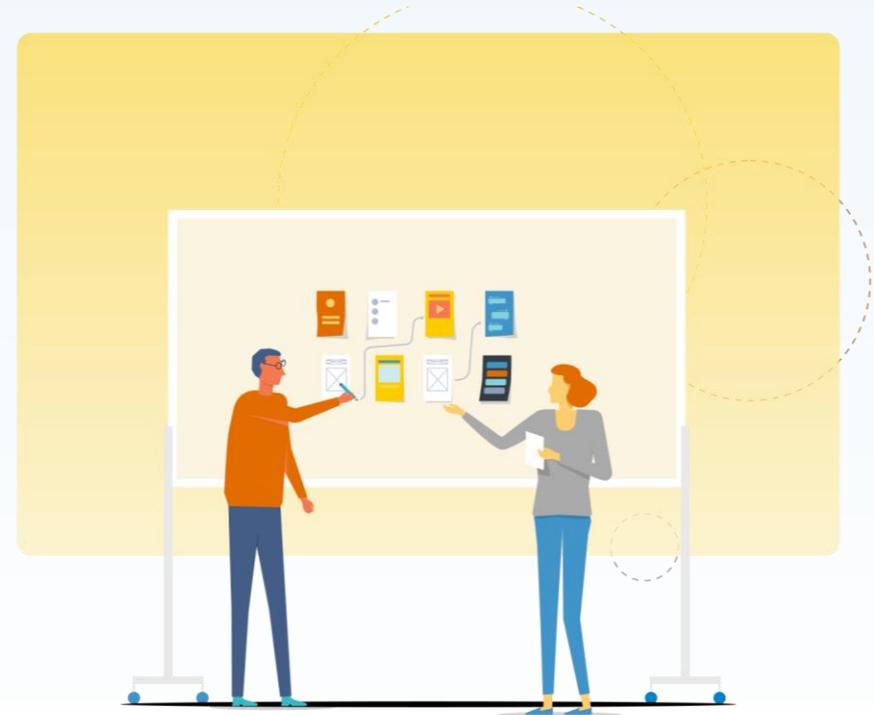
SIMULATIONS

- ▼ Result 2
- Case 1
- Case 2
- Case 3
- Case 4
- Case 5
- Result 1



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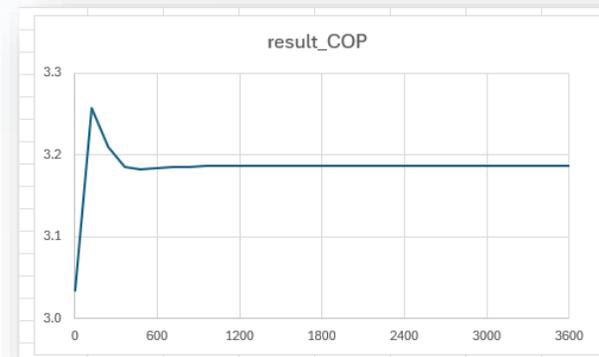
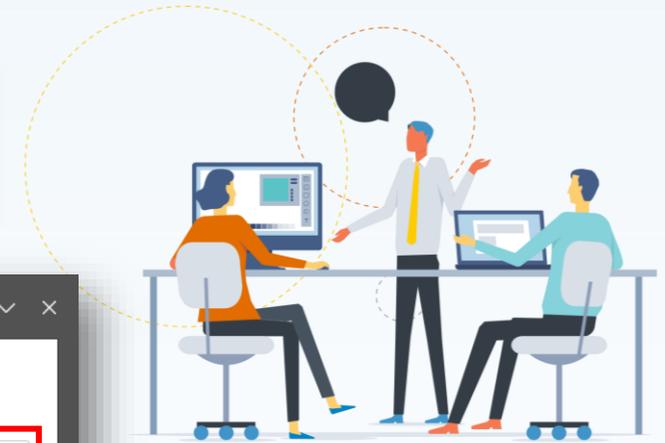
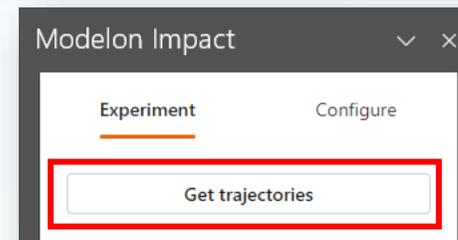


Retrieving Result Trajectories

Results are values at final time! Best for steady-state simulations or integrated values. To get result trajectories:

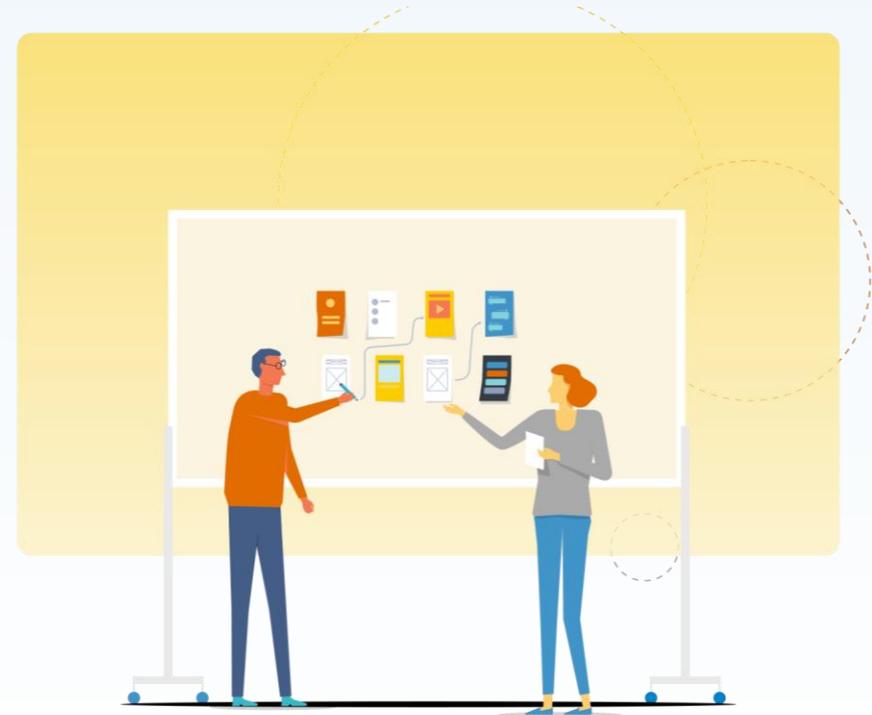
1. Chose "yes" in input field "Trajectory"
2. Click "Get trajectories"
3. Go to sheet "Result ModelonExperiment"
4. Check (optionally plot) result trajectories

Unit	Trajectory	Baseline	Cas
	YES	3.233857	3.1
W	YES	5052760	53
W	YES	6339905	169



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Not covered

- Optimization
- Reload Baseline experiment
- Time-series inputs (arrays)



Thanks for participating!

Feedback : Please scan QR-code and fill out form 😊

Questions: daniel.rohde@modelon.com



Modelon