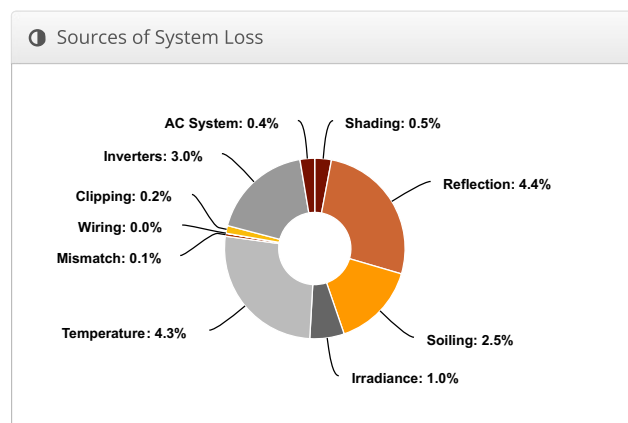
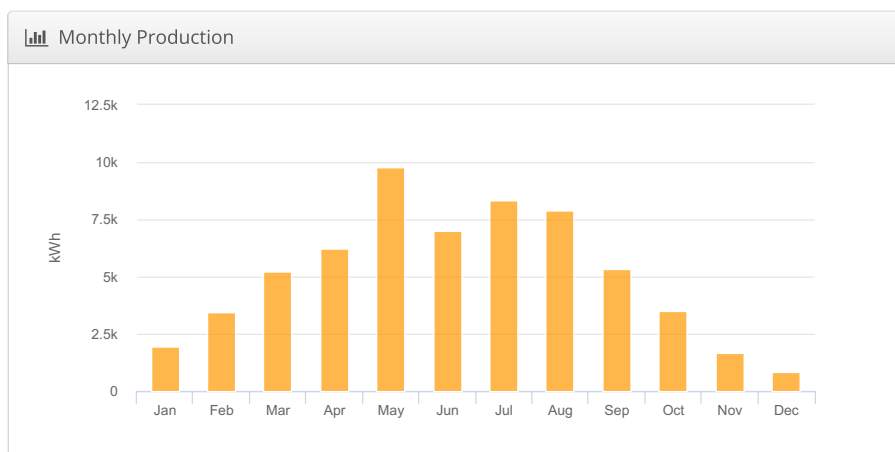
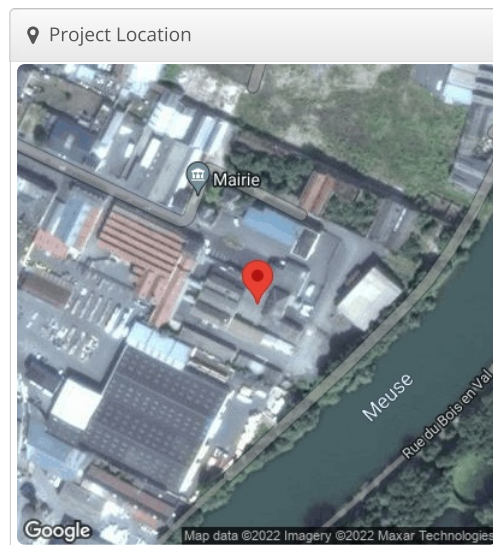


# Partie 1

## ABATTOIRS MUNICIPAUX, RUE DE L'ABATTOIR, 08000 Charleville-Mézières

Report	
Project Name	ABATTOIRS MUNICIPAUX
Project Address	RUE DE L'ABATTOIR, 08000 Charleville-Mézières
Prepared By	Kamar Amine kamin008@fiu.edu

System Metrics	
Design	Partie 1
Module DC Nameplate	59.7 kW
Inverter AC Nameplate	45.0 kW Load Ratio: 1.33
Annual Production	61.14 MWh
Performance Ratio	84.6%
kWh/kWp	1,024.6
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)
Simulator Version	584ec3959c-fcc359c7c9-41f4d01faa-fd97d6d116



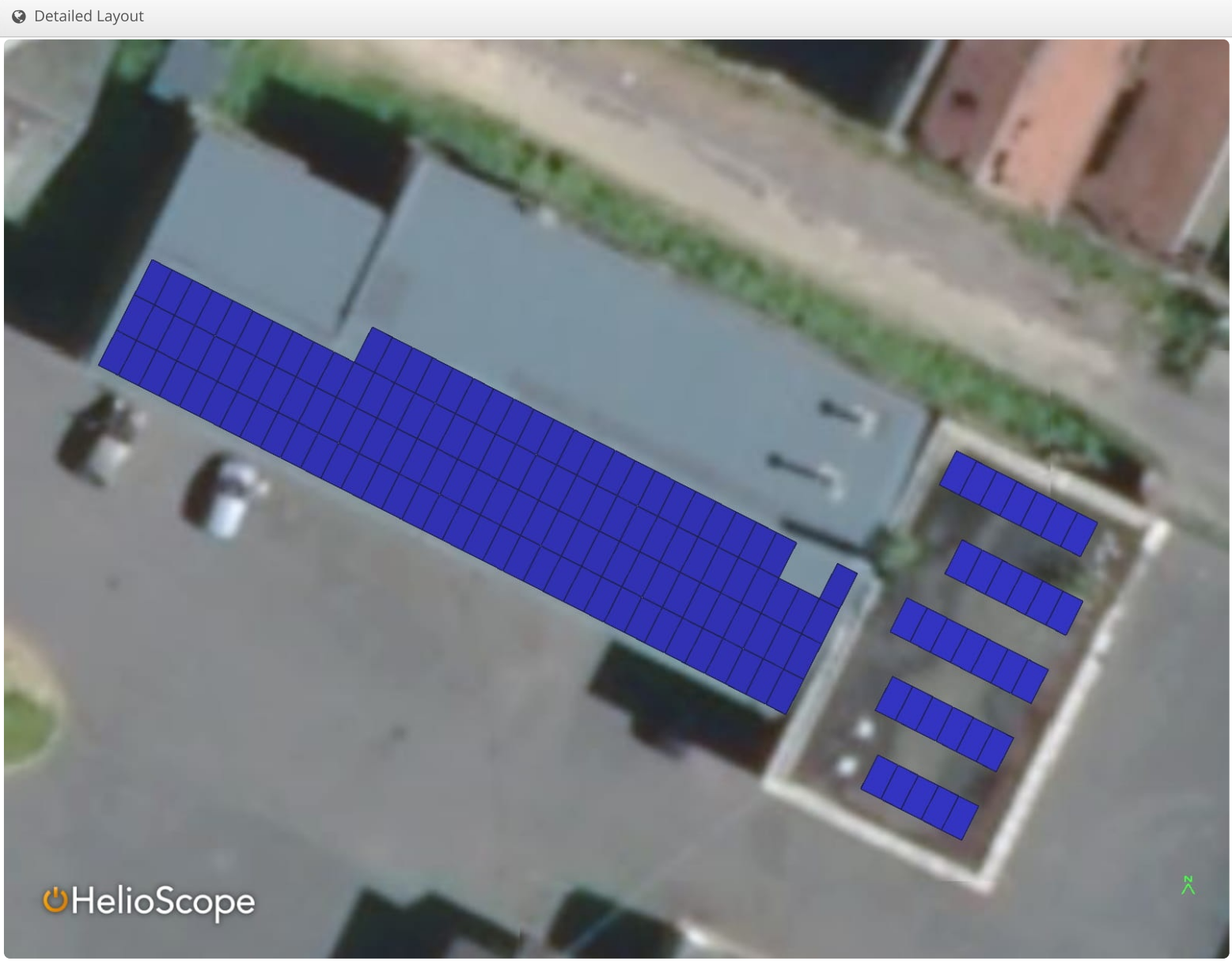
Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m <sup>2</sup> )	Annual Global Horizontal Irradiance	1,169.8	
	POA Irradiance	1,211.2	3.5%
	Shaded Irradiance	1,205.3	-0.5%
	Irradiance after Reflection	1,152.6	-4.4%
	Irradiance after Soiling	1,123.7	-2.5%
	<b>Total Collector Irradiance</b>	<b>1,123.7</b>	<b>0.0%</b>
Energy (kWh)	Nameplate	67,065.0	
	Output at Irradiance Levels	66,385.4	-1.0%
	Output at Cell Temperature Derate	63,511.6	-4.3%
	Output After Mismatch	63,455.2	-0.1%
	Optimal DC Output	63,455.2	0.0%
	Constrained DC Output	63,312.5	-0.2%
	Inverter Output	61,407.5	-3.0%
	<b>Energy to Grid</b>	<b>61,142.1</b>	<b>-0.4%</b>
Temperature Metrics			
	Avg. Operating Ambient Temp		12.3 °C
	Avg. Operating Cell Temp		24.5 °C
Simulation Metrics			
	Operating Hours	4211	
	Solved Hours	4211	

☁ Condition Set													
Description	Condition Set 1												
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)												
Solar Angle Location	Meteo Lat/Lng												
Transposition Model	Perez Model												
Temperature Model	Sandia Model												
Temperature Model Parameters	Rack Type	a		b		Temperature Delta							
	Fixed Tilt	-3.56		-0.075		3°C							
	Flush Mount	-2.81		-0.0455		0°C							
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D	
	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Irradiation Variance	5%												
Cell Temperature Spread	4° C												
Module Binning Range	-2.5% to 2.5%												
AC System Derate	3.00%												
Module Characterizations	Module					Uploaded By		Characterization					
	TARKA 126 VSBD 385 (Voltec Solar)					HelioScope		Spec Sheet Characterization, PAN					
Component Characterizations	Device					Uploaded By		Characterization					
	IQ7A-72-2-US (208V) (2019) (Enphase)					HelioScope		Spec Sheet					

🗂 Components		
Component	Name	Count
Inverters	IQ7A-72-2-US (208V) (2019) (Enphase)	155 (45.0 kW)
AC Branches	1000 MCM (Aluminum)	4 (1,142.2 m)
Module	Voltec Solar, TARKA 126 VSBD 385 (385W)	155 (59.7 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	1-2	Along Racking

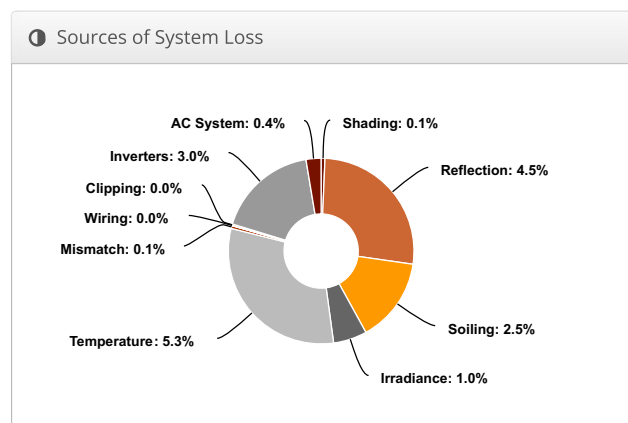
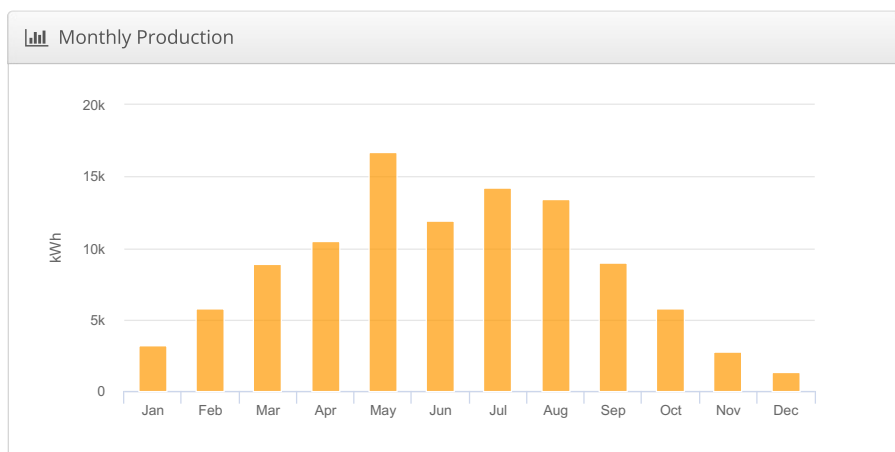
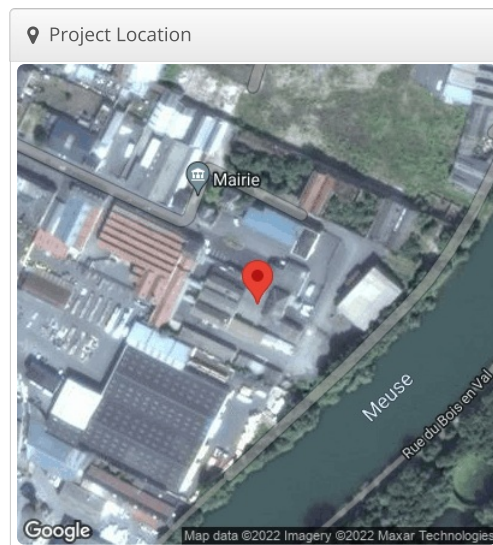
🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	5°	206.93765°	0.0 m	1x1	124	124	47.7 kW
Field Segment 2	Flush Mount	Portrait (Vertical)	6°	26.987621°	0.0 m	1x1			0
Field Segment 3	Flush Mount	Portrait (Vertical)	4.5°	26.908613°	0.0 m	1x1			0
Field Segment 4	Fixed Tilt	Portrait (Vertical)	15°	207.0008°	1.8 m	1x1	31	31	11.9 kW



## partie 2 ABATTOIRS MUNICIPAUX, RUE DE L'ABATTOIR, 08000 Charleville-Mézières

Report	
Project Name	ABATTOIRS MUNICIPAUX
Project Address	RUE DE L'ABATTOIR, 08000 Charleville-Mézières
Prepared By	Kamar Amine kamin008@fiu.edu

System Metrics	
Design	partie 2
Module DC Nameplate	100.5 kW
Inverter AC Nameplate	75.7 kW Load Ratio: 1.33
Annual Production	103.5 MWh
Performance Ratio	84.1%
kWh/kWp	1,029.5
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)
Simulator Version	584ec3959c-fcc359c7c9-41f4d01faa-fd97d6d116



Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m <sup>2</sup> )	Annual Global Horizontal Irradiance	1,169.8	
	POA Irradiance	1,224.2	4.6%
	Shaded Irradiance	1,222.8	-0.1%
	Irradiance after Reflection	1,167.5	-4.5%
	Irradiance after Soiling	1,138.3	-2.5%
	<b>Total Collector Irradiance</b>	<b>1,138.3</b>	<b>0.0%</b>
Energy (kWh)	Nameplate	114,384.3	
	Output at Irradiance Levels	113,247.9	-1.0%
	Output at Cell Temperature Derate	107,268.6	-5.3%
	Output After Mismatch	107,175.0	-0.1%
	Optimal DC Output	107,175.0	0.0%
	Constrained DC Output	107,127.3	0.0%
	Inverter Output	103,911.1	-3.0%
	<b>Energy to Grid</b>	<b>103,450.1</b>	<b>-0.4%</b>
Temperature Metrics			
	Avg. Operating Ambient Temp		12.3 °C
	Avg. Operating Cell Temp		26.2 °C
Simulation Metrics			
	Operating Hours	4211	
	Solved Hours	4211	

☁ Condition Set													
Description	Condition Set 1												
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)												
Solar Angle Location	Meteo Lat/Lng												
Transposition Model	Perez Model												
Temperature Model	Sandia Model												
Temperature Model Parameters	Rack Type	a		b		Temperature Delta							
	Fixed Tilt	-3.56		-0.075		3°C							
	Flush Mount	-2.81		-0.0455		0°C							
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D	
	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Irradiation Variance	5%												
Cell Temperature Spread	4° C												
Module Binning Range	-2.5% to 2.5%												
AC System Derate	3.00%												
Module Characterizations	Module					Uploaded By		Characterization					
	TARKA 126 VSBD 385 (Voltec Solar)					HelioScope		Spec Sheet Characterization, PAN					
Component Characterizations	Device					Uploaded By		Characterization					
	IQ7A-72-2-US (208V) (2019) (Enphase)					HelioScope		Spec Sheet					

📦 Components		
Component	Name	Count
Inverters	IQ7A-72-2-US (208V) (2019) (Enphase)	261 (75.7 kW)
AC Branches	1000 MCM (Aluminum)	6 (2,127.5 m)
Module	Voltec Solar, TARKA 126 VSBD 385 (385W)	261 (100.5 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	1-2	Along Racking

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	5°	132.8789°	0.0 m	1x1	261	261	100.5 kW



Detailed Layout



# partie 3

## ABATTOIRS MUNICIPAUX, RUE DE L'ABATTOIR, 08000 Charleville-Mézières

### Report

Project Name	ABATTOIRS MUNICIPAUX
Project Address	RUE DE L'ABATTOIR, 08000 Charleville-Mézières
Prepared By	Kamar Amine kamin008@fiu.edu

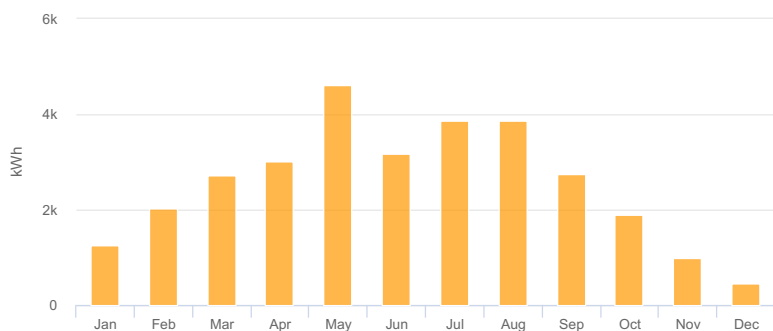
### System Metrics

Design	partie 3
Module DC Nameplate	27.3 kW
Inverter AC Nameplate	20.6 kW Load Ratio: 1.33
Annual Production	30.57 MWh
Performance Ratio	82.9%
kWh/kWp	1,118.3
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)
Simulator Version	584ec3959c-fcc359c7c9-41f4d01faa-fd97d6d116

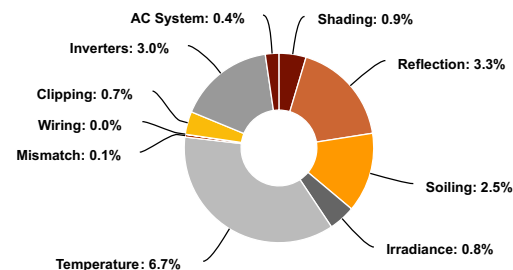
### Project Location



### Monthly Production



### Sources of System Loss



### Annual Production

	Description	Output	% Delta
Irradiance (kWh/m <sup>2</sup> )	Annual Global Horizontal Irradiance	1,169.8	
	POA Irradiance	1,349.1	15.3%
	Shaded Irradiance	1,337.6	-0.9%
	Irradiance after Reflection	1,293.6	-3.3%
	Irradiance after Soiling	1,261.3	-2.5%
	<b>Total Collector Irradiance</b>	<b>1,260.8</b>	<b>0.0%</b>
Energy (kWh)	Nameplate	34,475.3	
	Output at Irradiance Levels	34,187.7	-0.8%
	Output at Cell Temperature Derate	31,913.1	-6.7%
	Output After Mismatch	31,884.6	-0.1%
	Optimal DC Output	31,884.6	0.0%
	Constrained DC Output	31,656.4	-0.7%
	Inverter Output	30,698.5	-3.0%
	<b>Energy to Grid</b>	<b>30,568.0</b>	<b>-0.4%</b>
Temperature Metrics			
	Avg. Operating Ambient Temp		12.3 °C
	Avg. Operating Cell Temp		27.7 °C
Simulation Metrics			
	Operating Hours	4211	
	Solved Hours	4211	

☁ Condition Set														
Description	Condition Set 1													
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)													
Solar Angle Location	Meteo Lat/Lng													
Transposition Model	Perez Model													
Temperature Model	Sandia Model													
Temperature Model Parameters	Rack Type			a		b			Temperature Delta					
	Fixed Tilt			-3.56		-0.075			3°C					
	Flush Mount			-2.81		-0.0455			0°C					
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D		
	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
Irradiation Variance	5%													
Cell Temperature Spread	4° C													
Module Binning Range	-2.5% to 2.5%													
AC System Derate	3.00%													
Module Characterizations	Module					Uploaded By		Characterization						
	TARKA 126 VSBD 385 (Voltec Solar)					HelioScope		Spec Sheet Characterization, PAN						
Component Characterizations	Device						Uploaded By		Characterization					
	IQ7A-72-2-US (208V) (2019) (Enphase)						HelioScope		Spec Sheet					

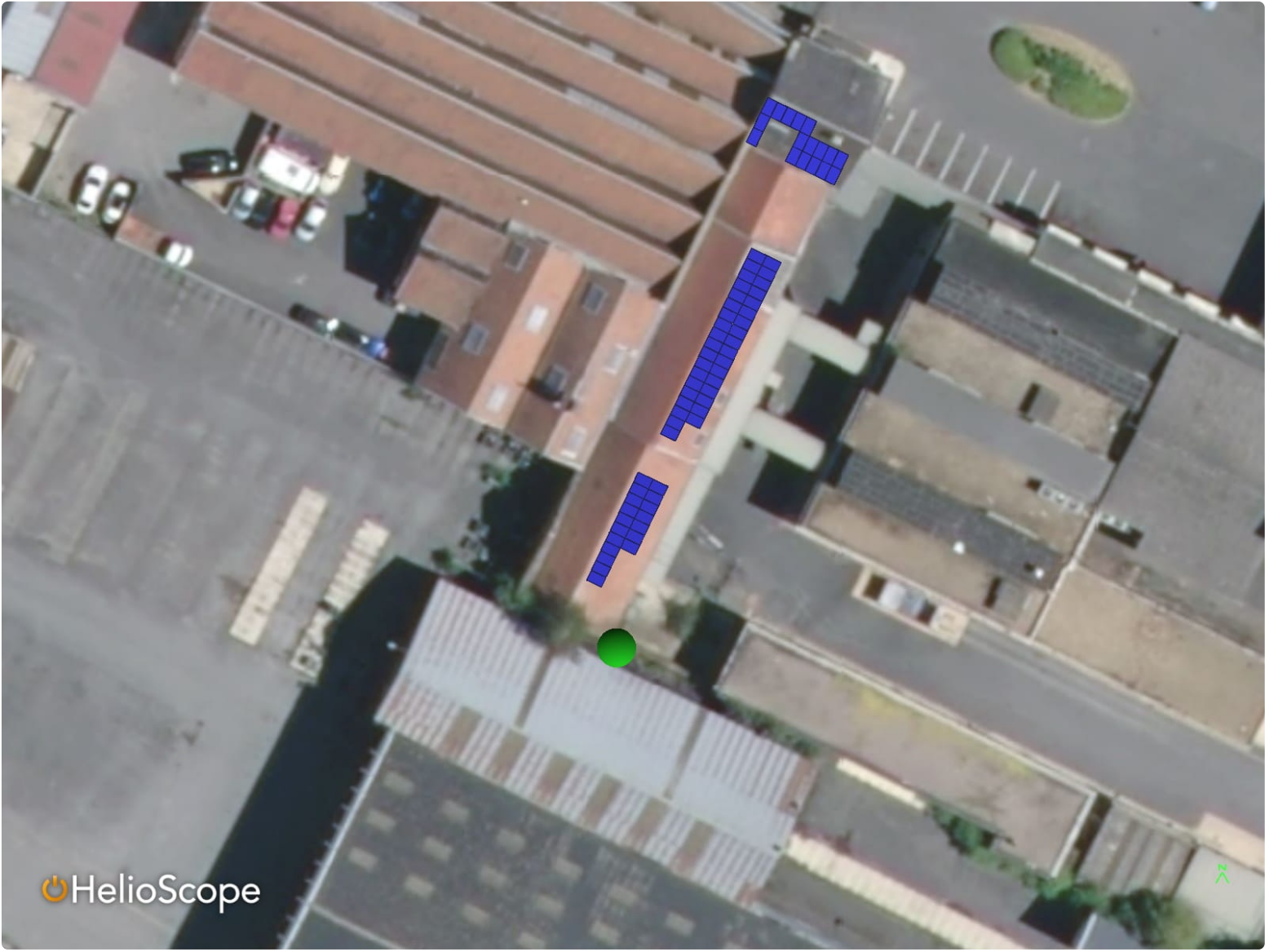
🗄 Components		
Component	Name	Count
Inverters	IQ7A-72-2-US (208V) (2019) (Enphase)	71 (20.6 kW)
AC Branches	1000 MCM (Aluminum)	2 (268.0 m)
Module	Voltec Solar, TARKA 126 VSBD 385 (385W)	71 (27.3 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	1-2	Along Racking

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Flush Mount	Portrait (Vertical)	30°	116.115685°	0.0 m	1x1	36	36	13.9 kW
Field Segment 2	Flush Mount	Portrait (Vertical)	30°	115.57445°	0.0 m	1x1	22	18	6.93 kW
Field Segment 2 (copy)	Flush Mount	Portrait (Vertical)	30°	295.57443°	0.0 m	1x1	0	0	0
Field Segment 1 (copy)	Flush Mount	Portrait (Vertical)	30°	296.1157°	0.0 m	1x1	0	0	0
Field Segment 5	Flush Mount	Portrait (Vertical)	30°	116.76765°	0.0 m	1x1	0	0	0
Field Segment 5 (copy)	Flush Mount	Portrait (Vertical)	30°	296.76764°	0.0 m	1x1	0	0	0
Field Segment 7	Flush Mount	Portrait (Vertical)	30°	206.01225°	0.0 m	1x1	18	17	6.55 kW
Field Segment 7 (copy)	Flush Mount	Portrait (Vertical)	30°	26.012255°	0.0 m	1x1	0	0	0



Detailed Layout

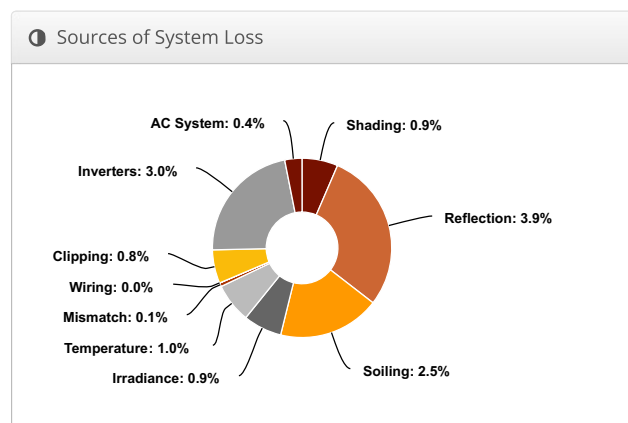
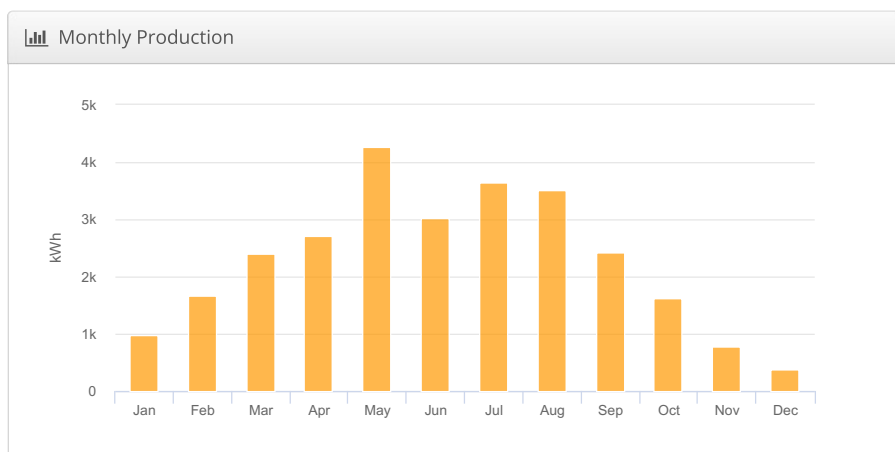
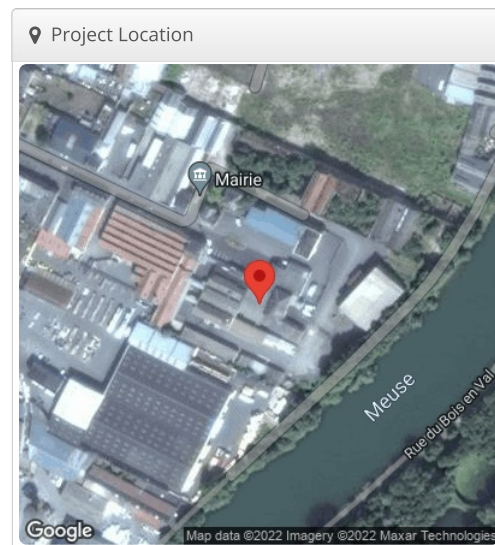


# partie 4

## ABATTOIRS MUNICIPAUX, RUE DE L'ABATTOIR, 08000 Charleville-Mézières

Report	
Project Name	ABATTOIRS MUNICIPAUX
Project Address	RUE DE L'ABATTOIR, 08000 Charleville-Mézières
Prepared By	Kamar Amine kamin008@fiu.edu

System Metrics	
Design	partie 4
Module DC Nameplate	25.0 kW
Inverter AC Nameplate	18.9 kW Load Ratio: 1.33
Annual Production	27.38 MWh
Performance Ratio	87.1%
kWh/kWp	1,093.9
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)
Simulator Version	584ec3959c-fcc359c7c9-41f4d01faa-fd97d6d116



⚡ Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,169.8	
	POA Irradiance	1,255.5	7.3%
	Shaded Irradiance	1,244.4	-0.9%
	Irradiance after Reflection	1,195.3	-3.9%
	Irradiance after Soiling	1,165.4	-2.5%
	Total Collector Irradiance	1,165.4	0.0%
Energy (kWh)	Nameplate	29,167.2	
	Output at Irradiance Levels	28,891.6	-0.9%
	Output at Cell Temperature Derate	28,611.8	-1.0%
	Output After Mismatch	28,584.7	-0.1%
	Optimal DC Output	28,584.7	0.0%
	Constrained DC Output	28,349.8	-0.8%
	Inverter Output	27,491.4	-3.0%
	Energy to Grid	27,375.2	-0.4%
Temperature Metrics			
Avg. Operating Ambient Temp		12.3 °C	
Avg. Operating Cell Temp		19.2 °C	
Simulation Metrics			
Operating Hours		4211	
Solved Hours		4211	

☁ Condition Set													
Description	Condition Set 1												
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)												
Solar Angle Location	Meteo Lat/Lng												
Transposition Model	Perez Model												
Temperature Model	Sandia Model												
Temperature Model Parameters	Rack Type	a		b		Temperature Delta							
	Fixed Tilt	-3.56		-0.075		3°C							
	Flush Mount	-2.81		-0.0455		0°C							
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D	
	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Irradiation Variance	5%												
Cell Temperature Spread	4° C												
Module Binning Range	-2.5% to 2.5%												
AC System Derate	3.00%												
Module Characterizations	Module					Uploaded By		Characterization					
	TARKA 126 VSBD 385 (Voltec Solar)					HelioScope		Spec Sheet Characterization, PAN					
Component Characterizations	Device					Uploaded By		Characterization					
	IQ7A-72-2-US (208V) (2019) (Enphase)					HelioScope		Spec Sheet					

🗂 Components		
Component	Name	Count
Inverters	IQ7A-72-2-US (208V) (2019) (Enphase)	65 (18.9 kW)
AC Branches	1000 MCM (Aluminum)	2 (445.7 m)
Module	Voltec Solar, TARKA 126 VSBD 385 (385W)	65 (25.0 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	1-2	Along Racking

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Portrait (Vertical)	15°	205.93921°	1.8 m	1x1	65	65	25.0 kW
Field Segment 2	Fixed Tilt	Portrait (Vertical)	15°	205.93921°	1.8 m	1x1			0
Field Segment 3	Fixed Tilt	Portrait (Vertical)	15°	207.04298°	1.8 m	1x1			0
Field Segment 4	Flush Mount	Portrait (Vertical)	5°	296.32727°	1.8 m	1x1			0
Field Segment 4 (copy)	Flush Mount	Portrait (Vertical)	5°	116.32728°	1.8 m	1x1			0

Detailed Layout

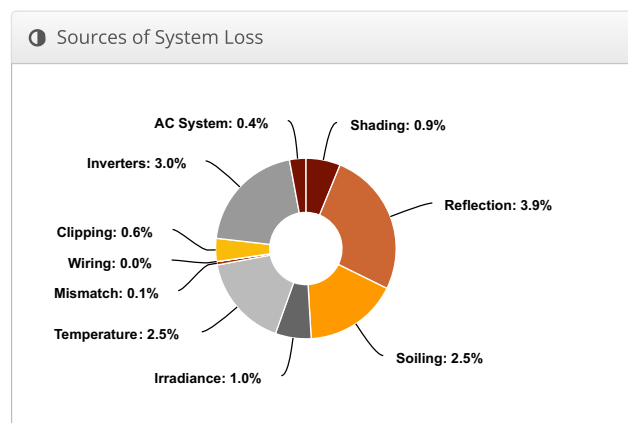
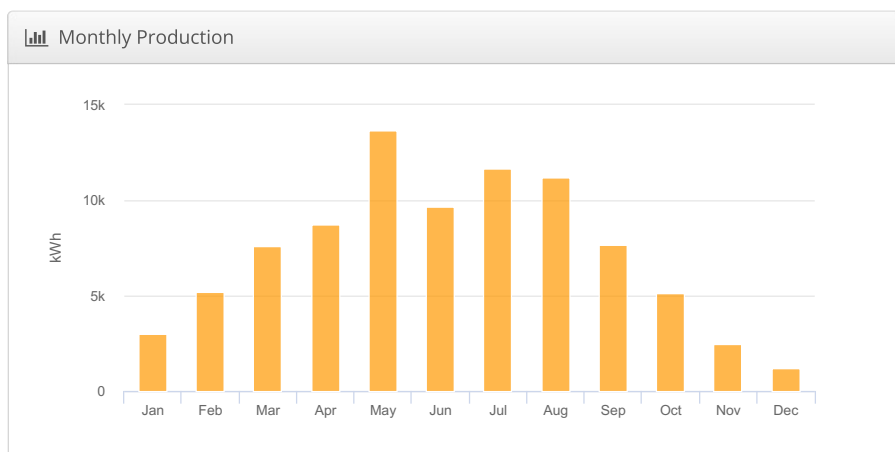
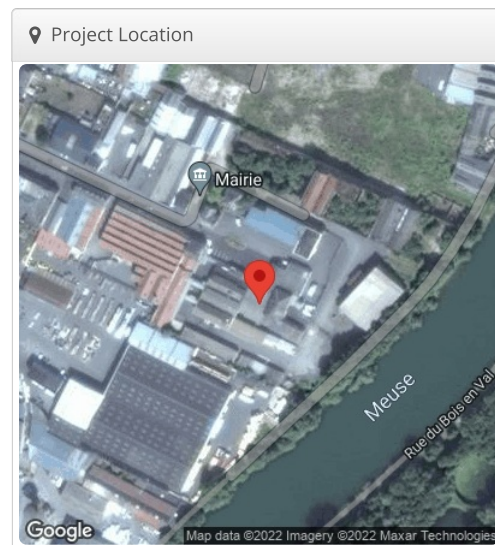




# Partie 5 ABATTOIRS MUNICIPAUX, RUE DE L'ABATTOIR, 08000 Charleville-Mézières

Report	
Project Name	ABATTOIRS MUNICIPAUX
Project Address	RUE DE L'ABATTOIR, 08000 Charleville-Mézières
Prepared By	Kamar Amine kamin008@fiu.edu

System Metrics	
Design	Partie 5
Module DC Nameplate	81.2 kW
Inverter AC Nameplate	61.2 kW Load Ratio: 1.33
Annual Production	87.10 MWh
Performance Ratio	86.0%
kWh/kWp	1,072.3
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)
Simulator Version	584ec3959c-fcc359c7c9-41f4d01faa-fd97d6d116



⚡ Annual Production			
	Description	Output	% Delta
Irradiance (kWh/m²)	Annual Global Horizontal Irradiance	1,169.8	
	POA Irradiance	1,247.2	6.6%
	Shaded Irradiance	1,235.7	-0.9%
	Irradiance after Reflection	1,187.6	-3.9%
	Irradiance after Soiling	1,157.9	-2.5%
	Total Collector Irradiance	1,157.8	0.0%
Energy (kWh)	Nameplate	94,059.2	
	Output at Irradiance Levels	93,158.3	-1.0%
	Output at Cell Temperature Derate	90,852.9	-2.5%
	Output After Mismatch	90,768.9	-0.1%
	Optimal DC Output	90,768.9	0.0%
	Constrained DC Output	90,211.6	-0.6%
	Inverter Output	87,486.0	-3.0%
	Energy to Grid	87,104.5	-0.4%
Temperature Metrics			
Avg. Operating Ambient Temp		12.3 °C	
Avg. Operating Cell Temp		21.5 °C	
Simulation Metrics			
Operating Hours		4211	
Solved Hours		4211	

☁ Condition Set													
Description	Condition Set 1												
Weather Dataset	TMY, unknown, ECMWF/ERA (custom)												
Solar Angle Location	Meteo Lat/Lng												
Transposition Model	Perez Model												
Temperature Model	Sandia Model												
Temperature Model Parameters	Rack Type			a		b			Temperature Delta				
	Fixed Tilt			-3.56		-0.075			3°C				
	Flush Mount			-2.81		-0.0455			0°C				
Soiling (%)	J	F	M	A	M	J	J	A	S	O	N	D	
	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Irradiation Variance	5%												
Cell Temperature Spread	4° C												
Module Binning Range	-2.5% to 2.5%												
AC System Derate	3.00%												
Module Characterizations	Module					Uploaded By		Characterization					
	TARKA 126 VSBD 385 (Voltec Solar)					HelioScope		Spec Sheet Characterization, PAN					
Component Characterizations	Device						Uploaded By		Characterization				
	IQ7A-72-2-US (208V) (2019) (Enphase)						HelioScope		Spec Sheet				

🗂 Components		
Component	Name	Count
Inverters	IQ7A-72-2-US (208V) (2019) (Enphase)	211 (61.2 kW)
AC Branches	1000 MCM (Aluminum)	5 (609.6 m)
Module	Voltec Solar, TARKA 126 VSBD 385 (385W)	211 (81.2 kW)

🔌 Wiring Zones			
Description	Combiner Poles	String Size	Stringing Strategy
Wiring Zone	-	1-2	Along Racking

🏠 Field Segments									
Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Portrait (Vertical)	15°	205.44174°	1.8 m	1x1	42	42	16.2 kW
Field Segment 2	Fixed Tilt	Portrait (Vertical)	15°	205.44174°	1.8 m	1x1	7	7	2.70 kW
Field Segment 3	Fixed Tilt	Portrait (Vertical)	15°	206.9676°	1.8 m	1x1	13	13	5.01 kW
Field Segment 4	Fixed Tilt	Portrait (Vertical)	15°	206.65213°	1.8 m	1x1	16	16	6.16 kW
Field Segment 5	Fixed Tilt	Portrait (Vertical)	15°	206.5075°	1.8 m	1x1	21	21	8.09 kW
Field Segment 6	Fixed Tilt	Portrait (Vertical)	15°	206.18747°	1.8 m	1x1	21	21	8.09 kW
Field Segment 7	Flush Mount	Portrait (Vertical)	5°	206.32542°	1.8 m	1x1	31	31	11.9 kW
Field Segment 8	Flush Mount	Portrait (Vertical)	5°	207.28738°	1.8 m	1x1	25	25	9.63 kW
Field Segment 9	Flush Mount	Portrait (Vertical)	5°	26.018326°	1.8 m	1x1			0
Field Segment 10	Flush Mount	Portrait (Vertical)	30°	115.55489°	1.8 m	1x1	11	11	4.24 kW
Field Segment 11	Flush Mount	Portrait (Vertical)	25°	296.64633°	1.8 m	1x1			0
Field Segment 12	Flush Mount	Portrait (Vertical)	30°	207.16748°	1.8 m	1x1	4	4	1.54 kW
Field Segment 13	Flush Mount	Portrait (Vertical)	26°	26.778717°	1.8 m	1x1			0
Field Segment 14	Flush Mount	Portrait (Vertical)	5°	25.22912°	1.8 m	1x1			0
Field Segment 15	Fixed Tilt	Portrait (Vertical)	15°	205.62671°	1.8 m	1x1	13	13	5.01 kW
Field Segment 16	Fixed Tilt	Portrait (Vertical)	15°	205.62671°	1.8 m	1x1	7	7	2.70 kW
Field Segment 17	Flush Mount	Portrait (Vertical)	20°	295.65335°	1.8 m	1x1			0



Detailed Layout

