

Parametric Study of Solar Thermal Power Plant Configuration Utilizing System Advisor Model (SAM)

By: Jérémie Léger

UL Solar Thermal Team

Bio

- Senior student at Université de Moncton, New Brunswick Canada



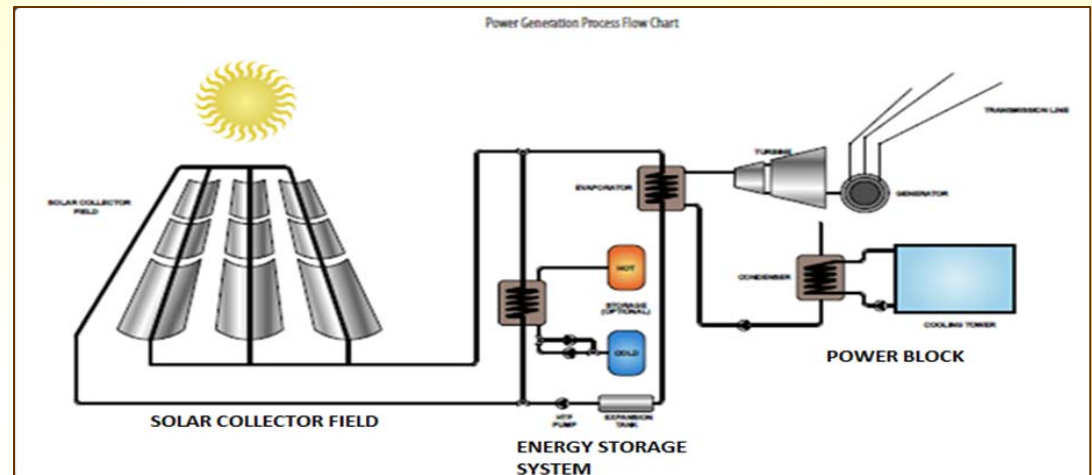
Presentation plan

- Introduction
- Objective
- Procedure
- Results
 - ORC
 - Steam cycle
- ORC VS Steam cycle
- Conclusion

Introduction

- Solar trough system
- Levelized cost of energy (LCOE)

$$LCOE = \frac{\sum_{i=1}^n \frac{cost_year_i}{(1+d)^i}}{\sum_{i=1}^n \frac{energy_produced_year_i}{(1+d)^i}}$$



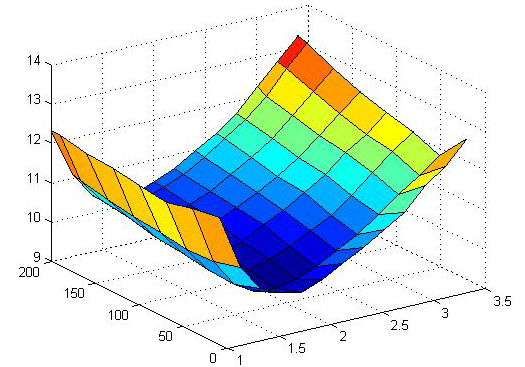
Objective

- Minimize LCOE
- Project feasibility
- ORC VS Steam cycle



Procedure

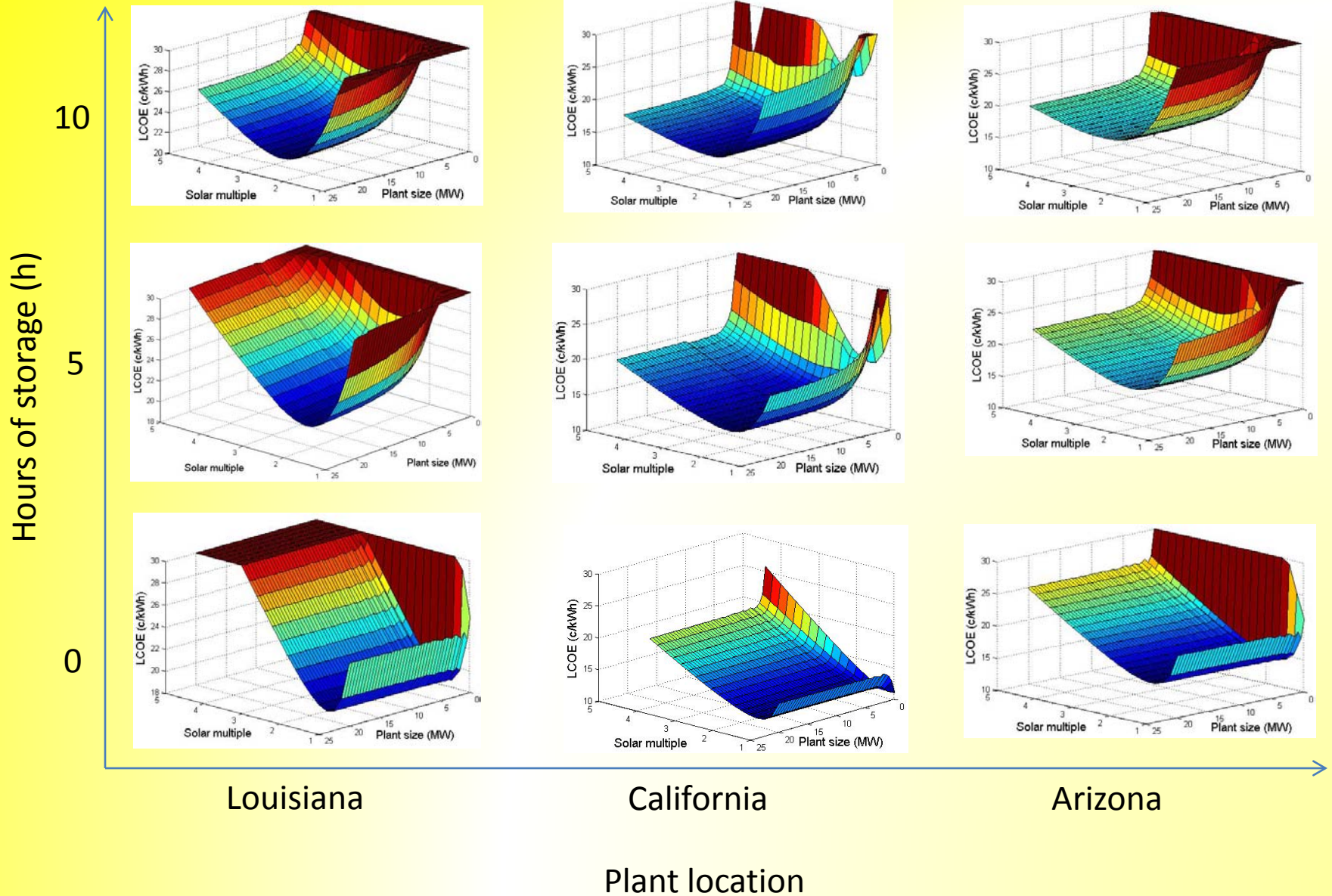
- Scenarios (location+plant type)
- Parameterized study
- Visualization of data (Matlab)



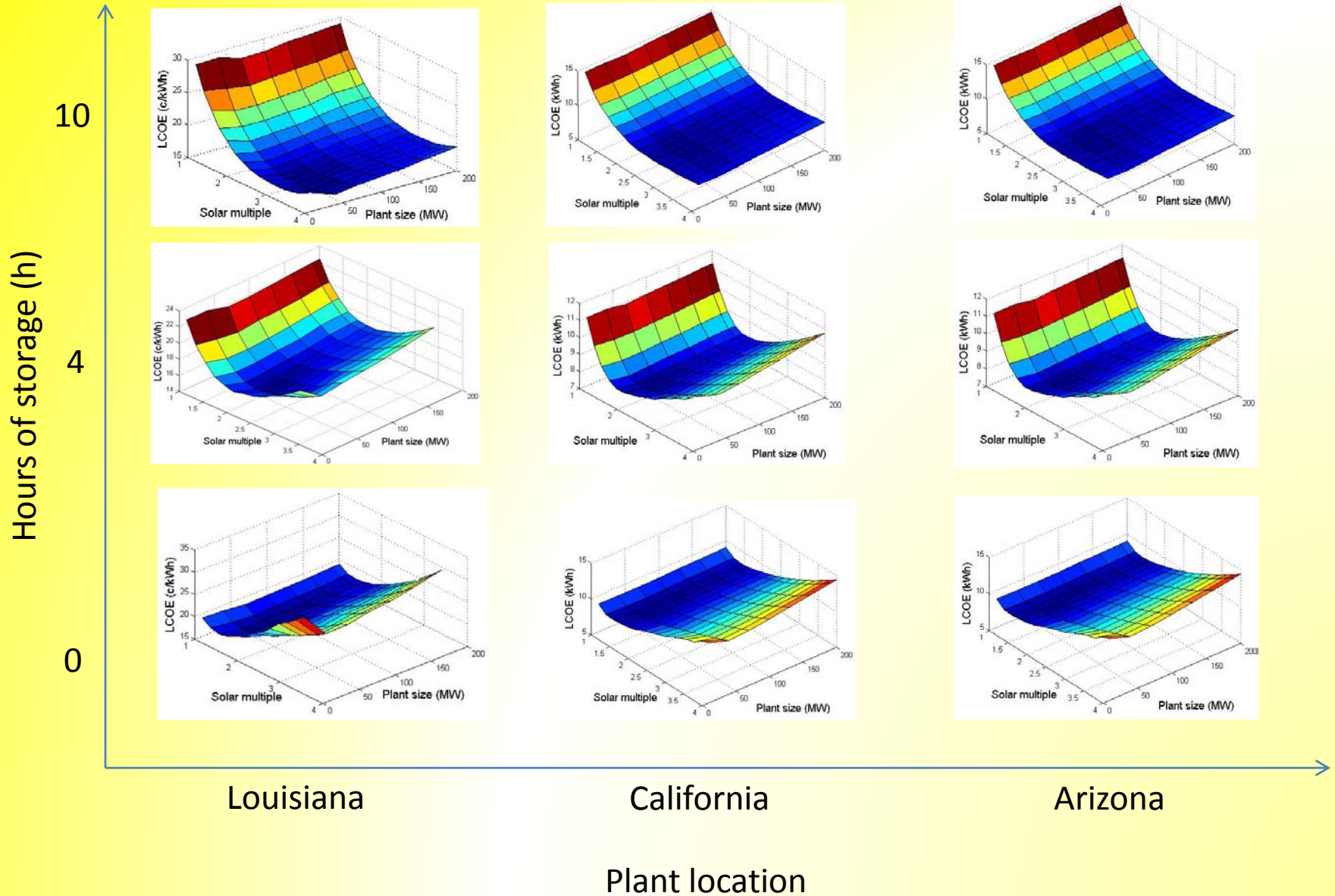
	California	Arizona	Louisiana
ORC	empirical	empirical	empirical
Steam cycle	Empirical/physical	Empirical/physical	Empirical/physical

		Plant size (MW)	Solar multiple	Hours of storage (h)
Organic Rankine cycle	Range	0.02 to 20.02	1 to 5	0 to 10
	increment	0.5	0.2	1
Steam Cycle	Range	10 to 200	1 to 2	0 to 10
	Increment	30	0.2	1.5

ORC Results

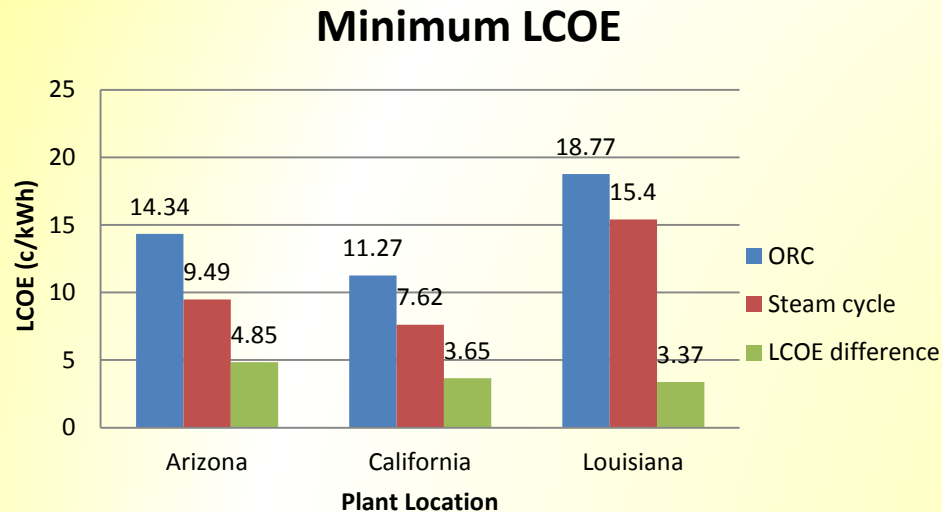


Steam cycle Results



ORC VS Steam cycle

- Effect of location
- Why consider ORC
- Project feasibility in Louisiana



Conclusion

- Importance of plant design
- Solar energy in Louisiana
- Future physical ORC model (SAM)



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Questions

