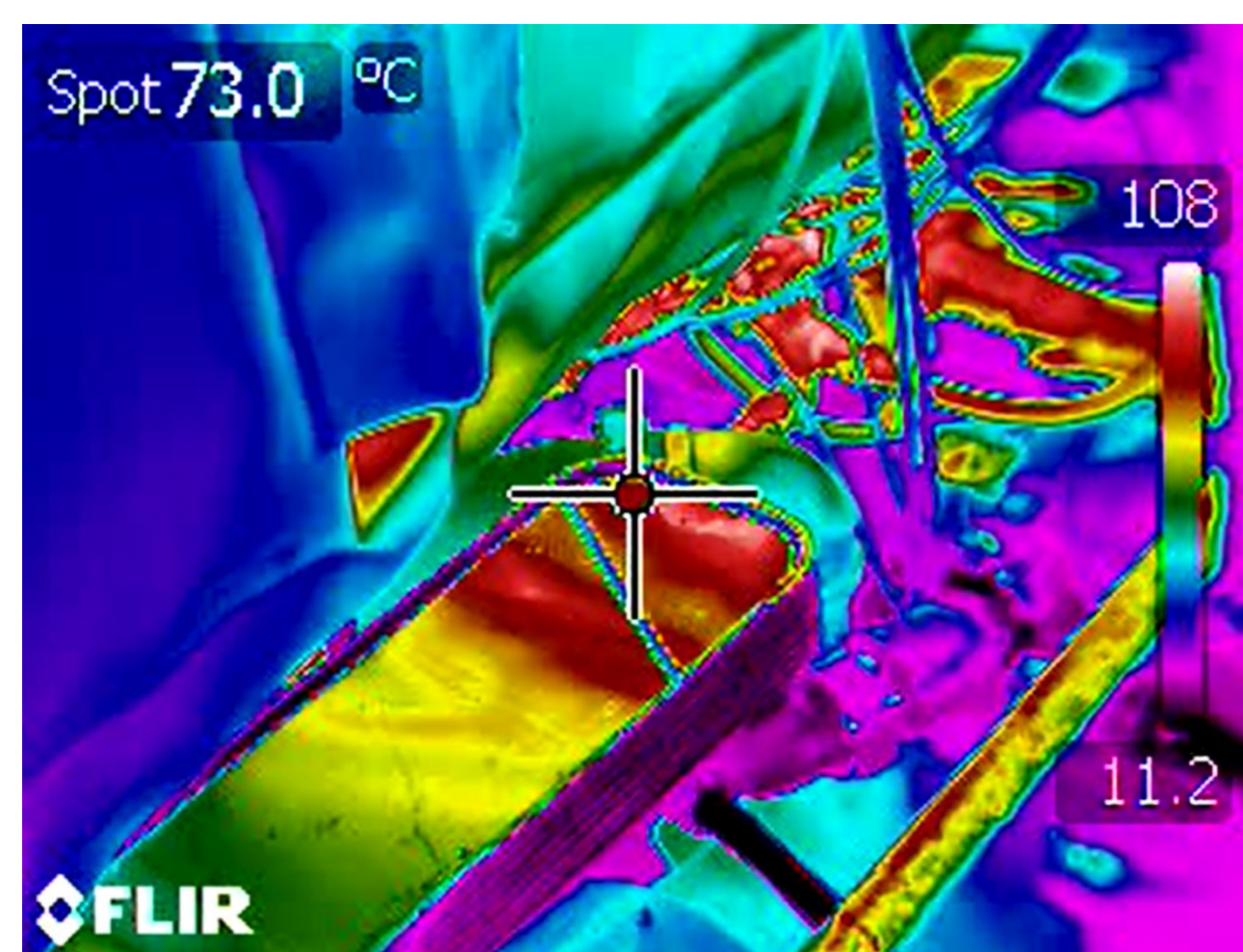
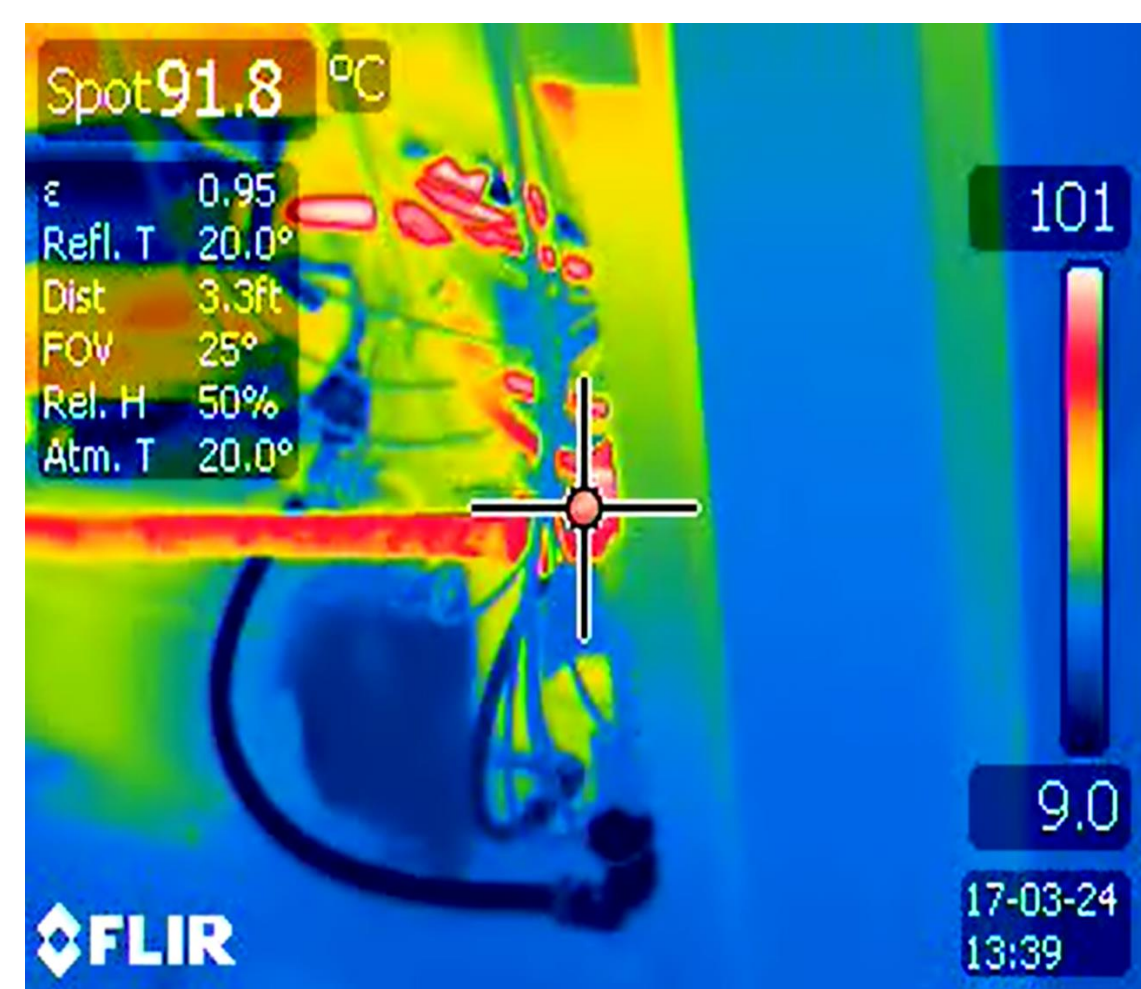


Project Objectives

- Evaluate input power requirements on existing wireless sensor boards STERI-Bee™
 - Determine possible solutions to provide wireless power
 - Assess effectiveness and efficiency of power options
- Investigate energy harvesting technology with focus on thermal energy harvesting
 - Test solutions on real sterilizer at STERIS

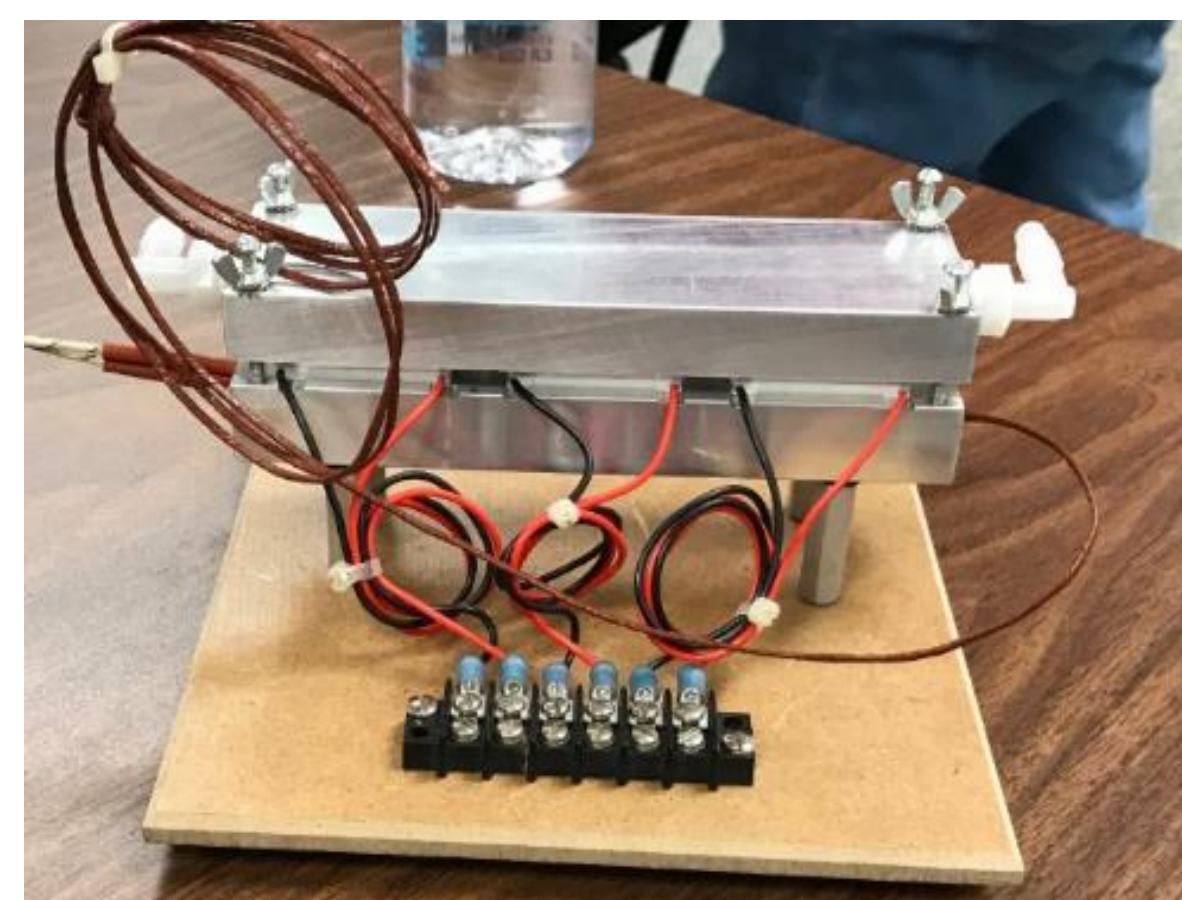
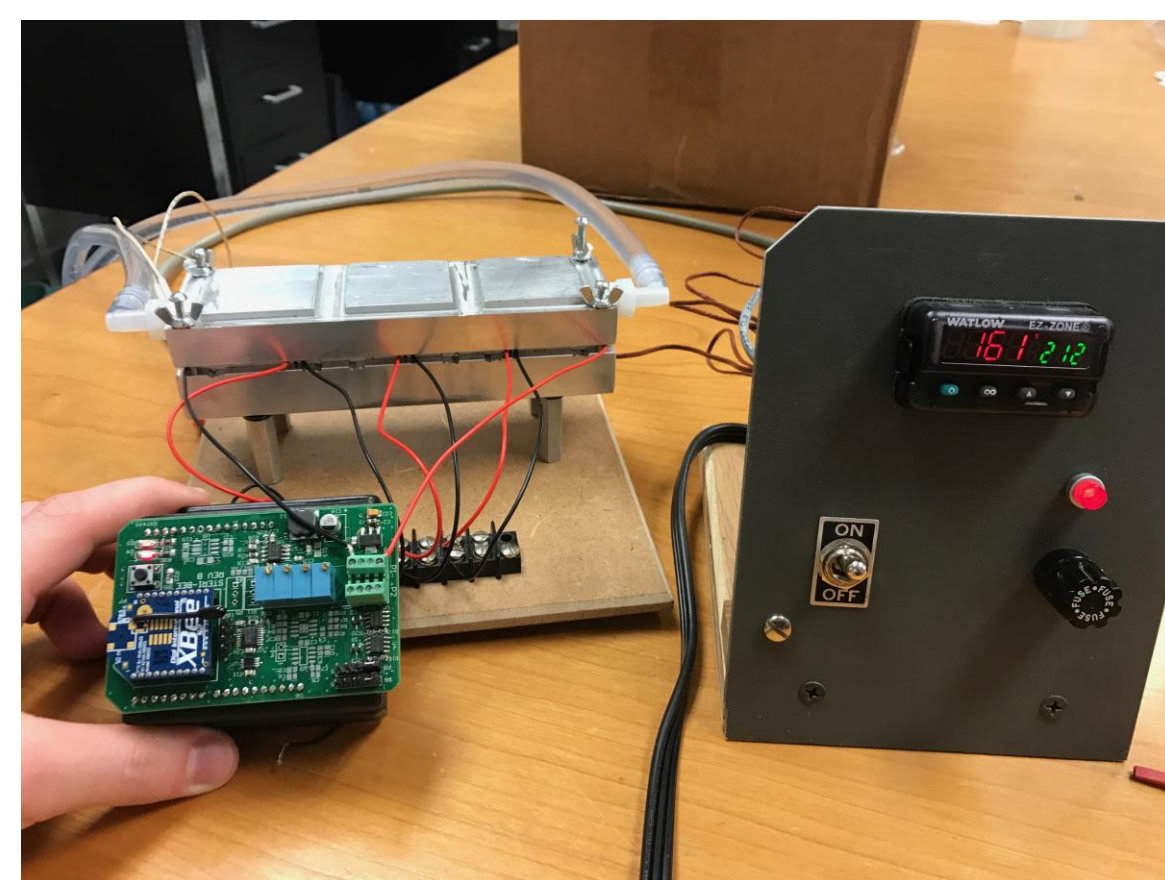
Heat Study

- Determine hot spots within sterilizer environment



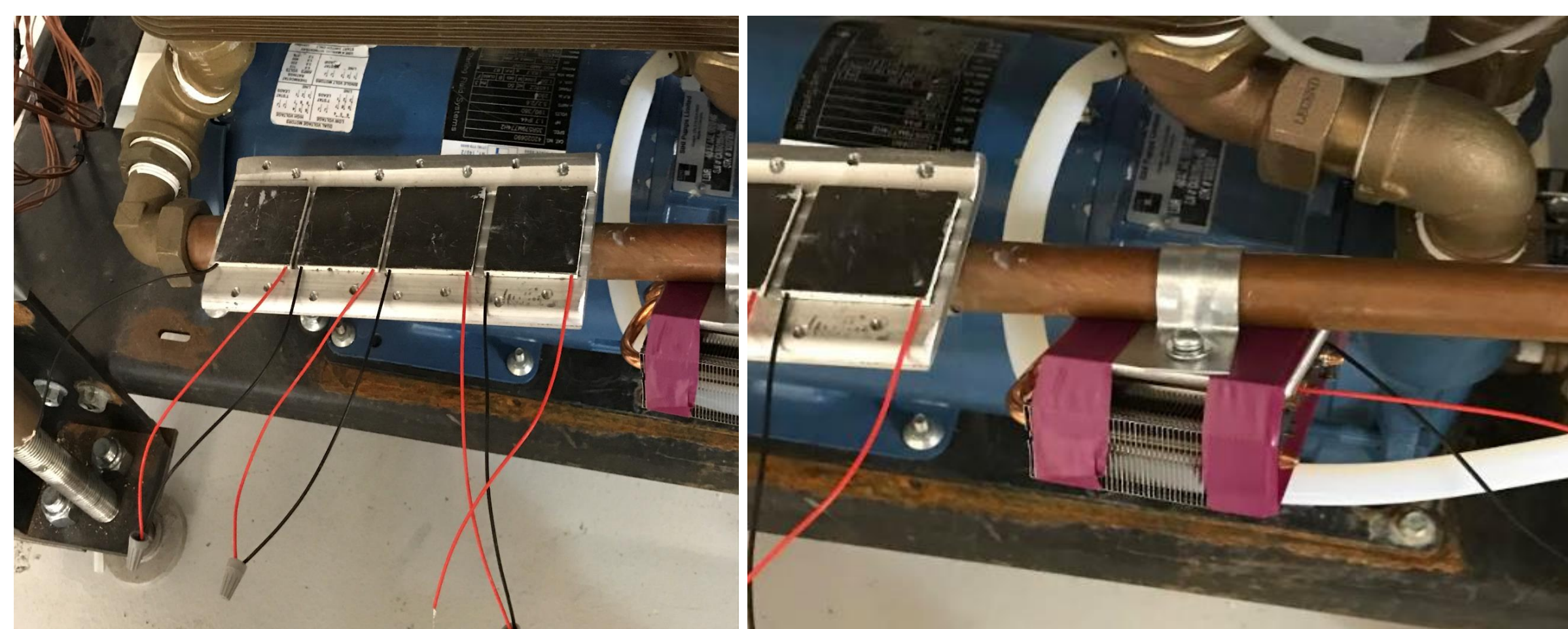
Test Stand

- Evaluate efficiency of Thermoelectric Generators
- Determine ideal temperature conditions to meet required power consumption



Test TEGs on Real Sterilizer

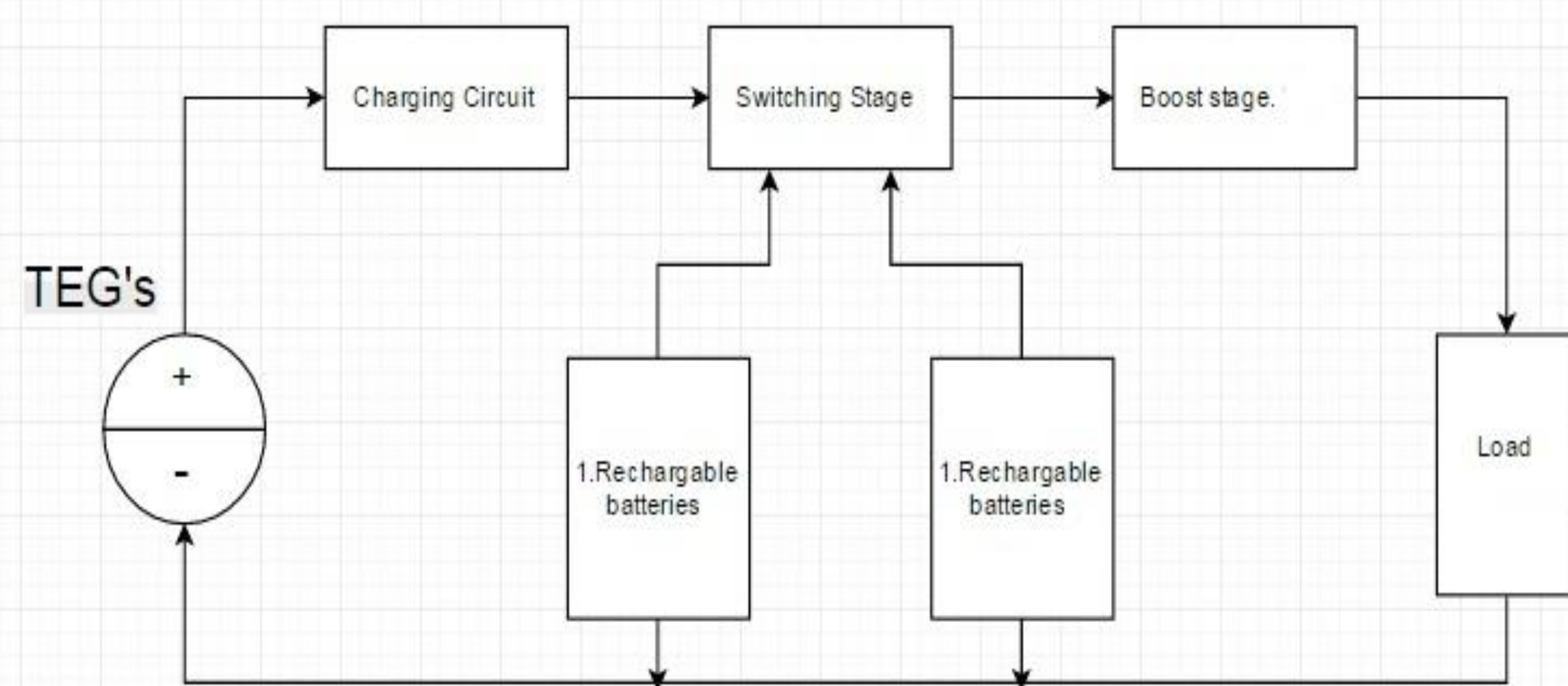
- Test TEGs within a real sterilizer environment to determine realistic power generation



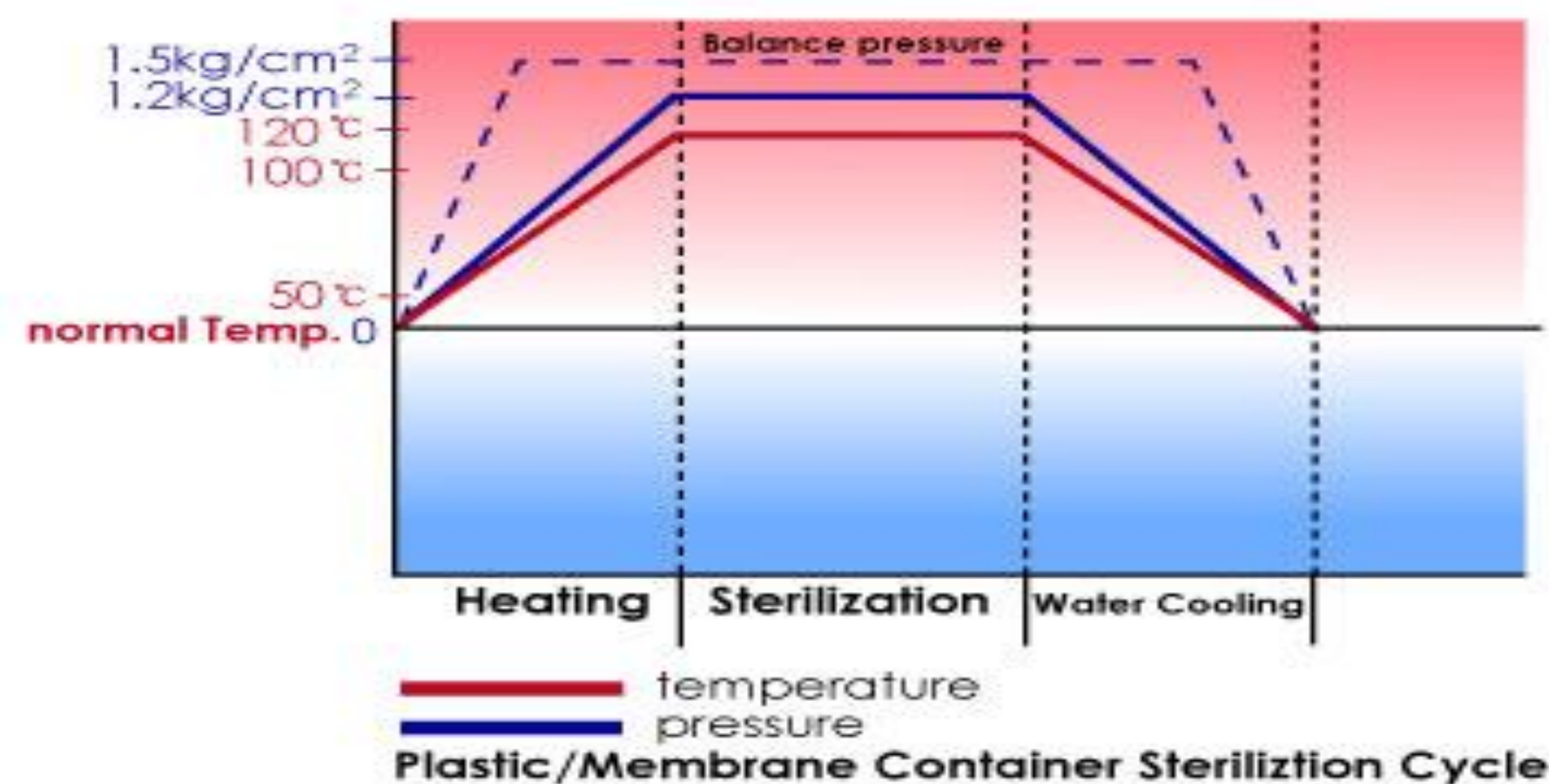
Design: A combination of TEGs and rechargeable batteries

Features:

- Overcome TEG's dependence on ΔT
- Supply the sensors voltage throughout sterilization cycle
- Extend battery lifetime



Sterilization cycle temperature curve



Future Recommendations :

Continuation of the solution:

- Most efficient switching reference level
- Reduction of switching power

Other Recommendations:

- Modify the autoclave unit (Increase ΔT)
- Reduce sensor's power consumption

Project Conclusions

- Under ideal lab settings, the wireless sensors can be successfully powered using TEGs alone
- Inside a realistic sterilizer environment, a more robust and reliable battery circuit is necessary
- TEG technology can still play a pivotal role by providing a source of energy for recharging the primary battery supply