

Renewable heating options

Renen / Sappi Pilot Heating Project

IPPS 2017, 3rd March

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SHARING PLANT PRODUCTION KNOWLEDGE



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biogas
biomass
heating
consulting
energy audits
research

domestic
industrial
commercial
agricultural



RENEN

Renewable Energy Solutions

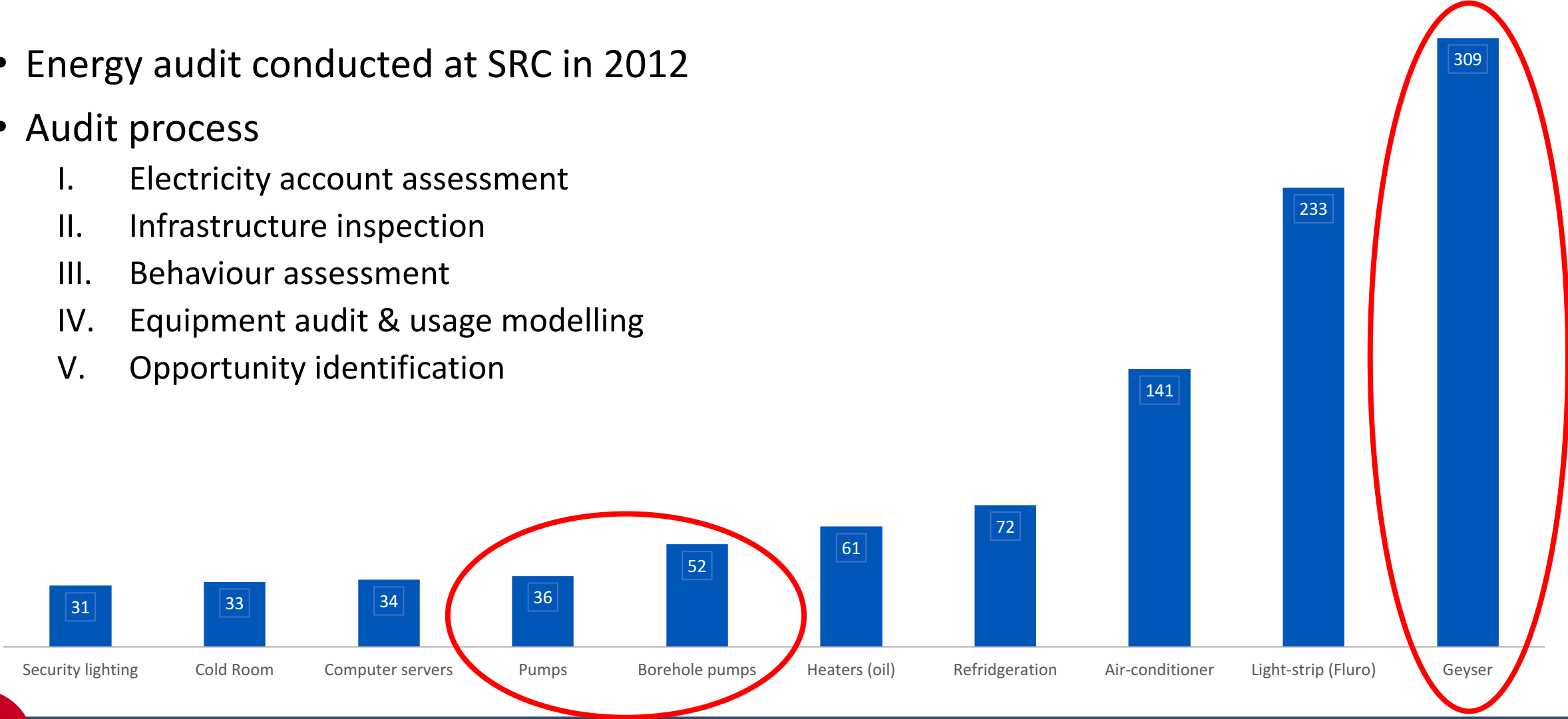
“The go-to alternative energy specialists.”

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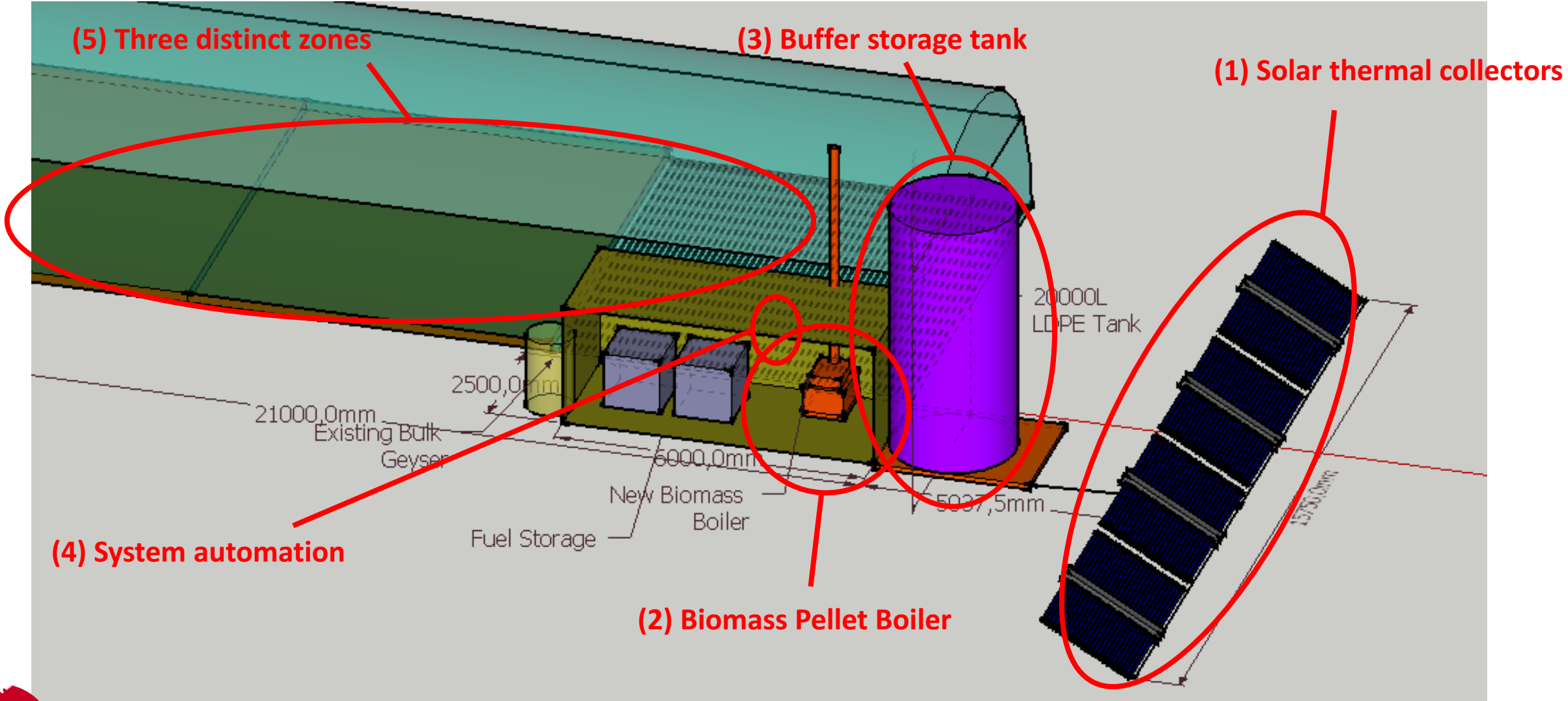
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Background | Sappi SRC Energy Audit

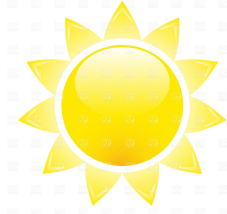
- Energy audit conducted at SRC in 2012
- Audit process
 - I. Electricity account assessment
 - II. Infrastructure inspection
 - III. Behaviour assessment
 - IV. Equipment audit & usage modelling
 - V. Opportunity identification



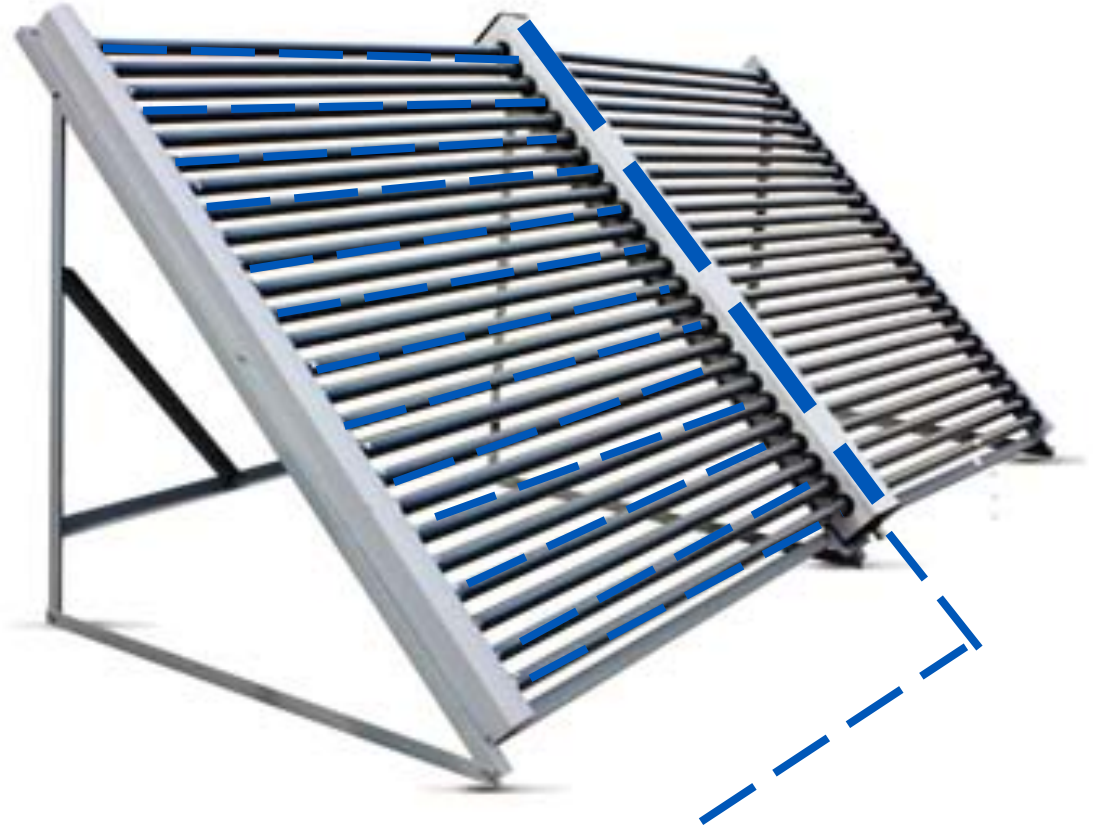
Heating solution | Solar thermal + Biomass



Heating solution | (1) Solar thermal collectors



- Four (4) x 50 tube low pressure collectors
- Avg. annual delivery 22 kWh/day each
- Benefits
 - I. Low maintenance
 - II. Modular and scalable
 - III. Most efficient known solar collectors



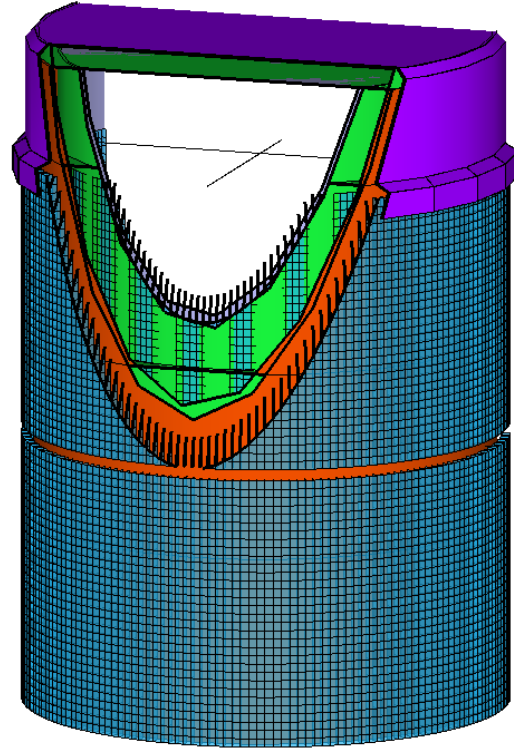
Heating solution | (2) Biomass pellet boiler

- 25 kW auto-feed biomass pellet boiler
- Why biomass pellet
 - I. High calorific value (16 MJ/kg)
 - II. Easily transported
 - III. Sustainability (GHG considerations)
 - IV. International trend toward biomass use, especially biomass pellet

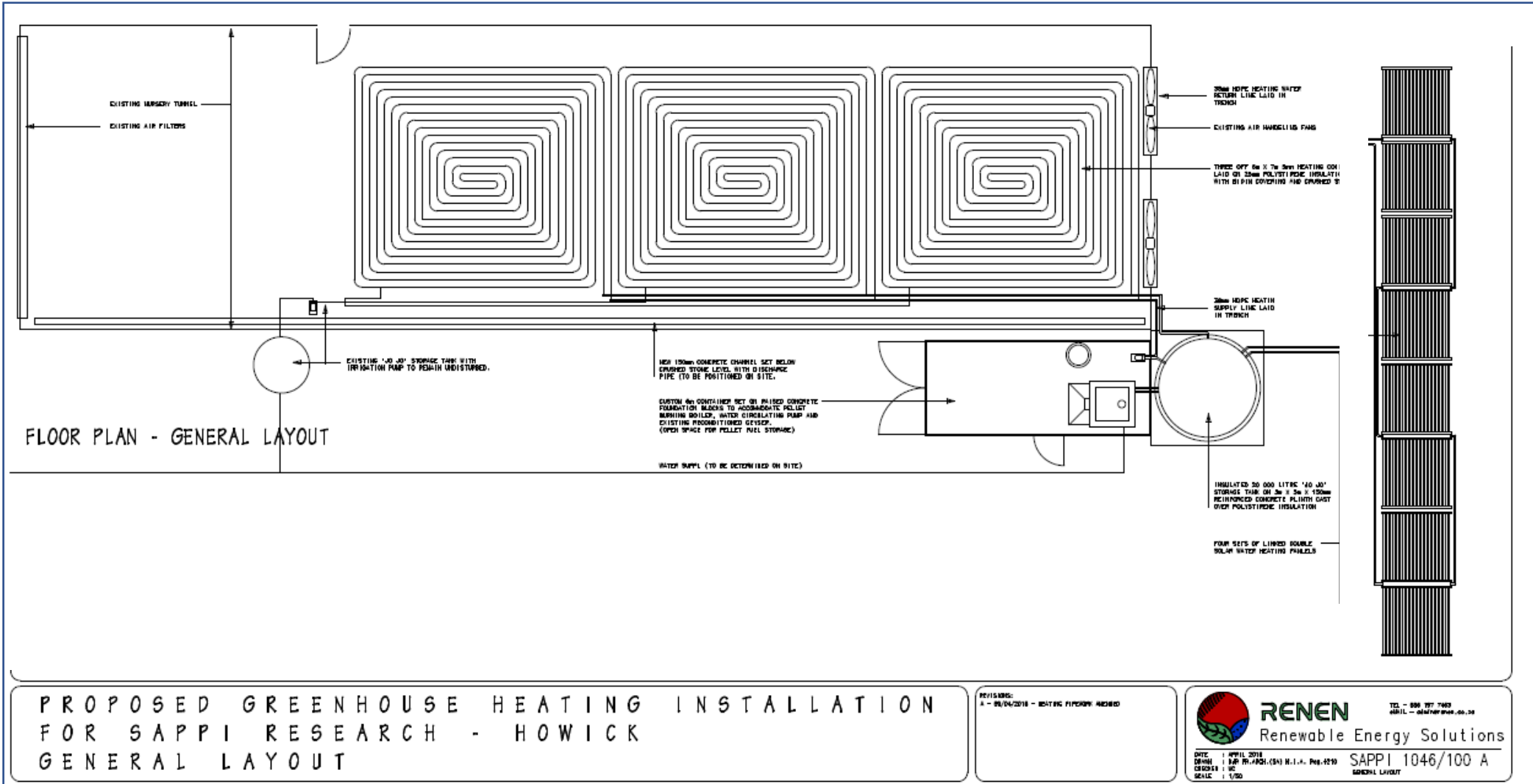


Heating solution | (3) Insulated buffer storage

- 20 000 litre buffer storage
- Designed to deliver sufficient hot water through a winter night
- Allows for energy to be captured during sunlight hours and used when required
- Modular & Scalable
- Insulation
 - I. Glass-fibre blanket
 - II. Support wire
 - III. Waterproof canvas.

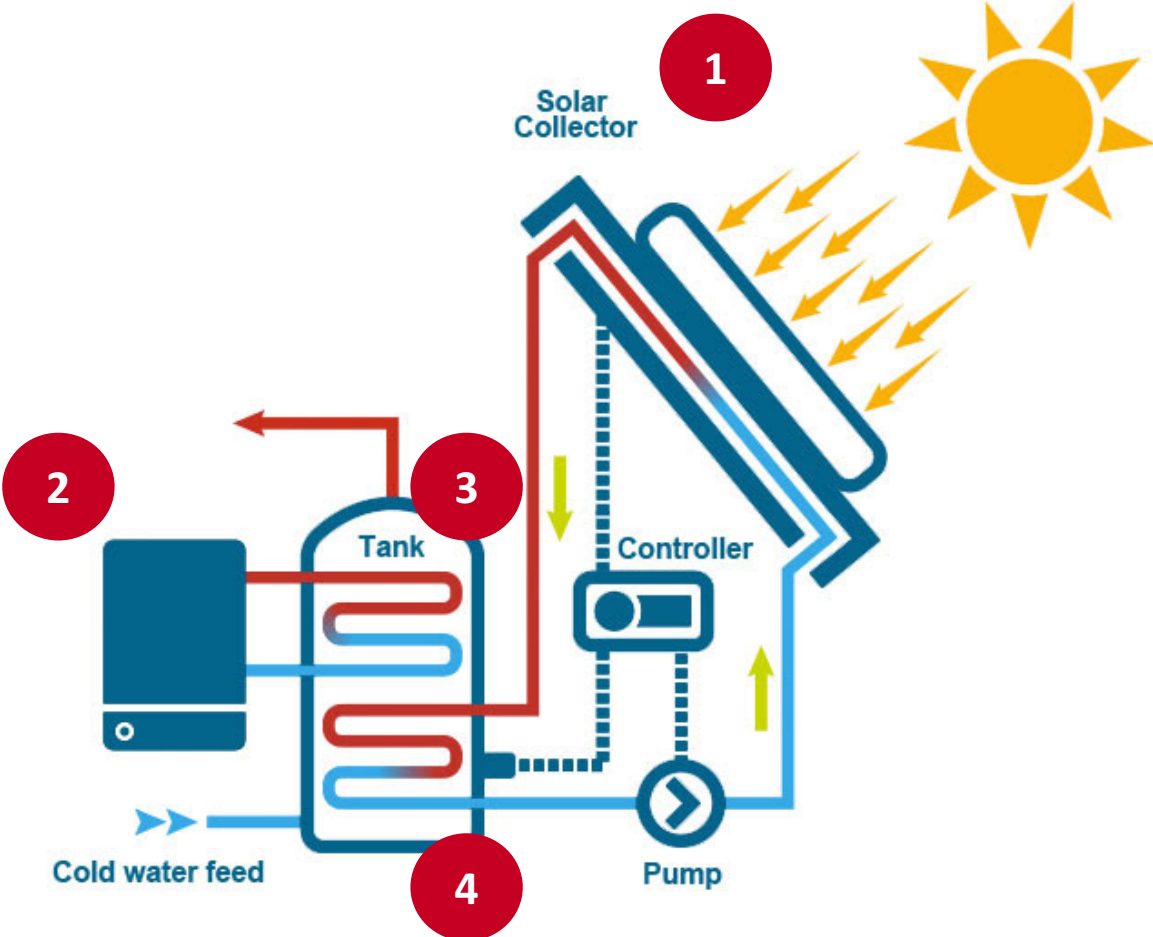


Heating solution | (4) Automation & (5) Zones



Results | Why solar, biomass combination?

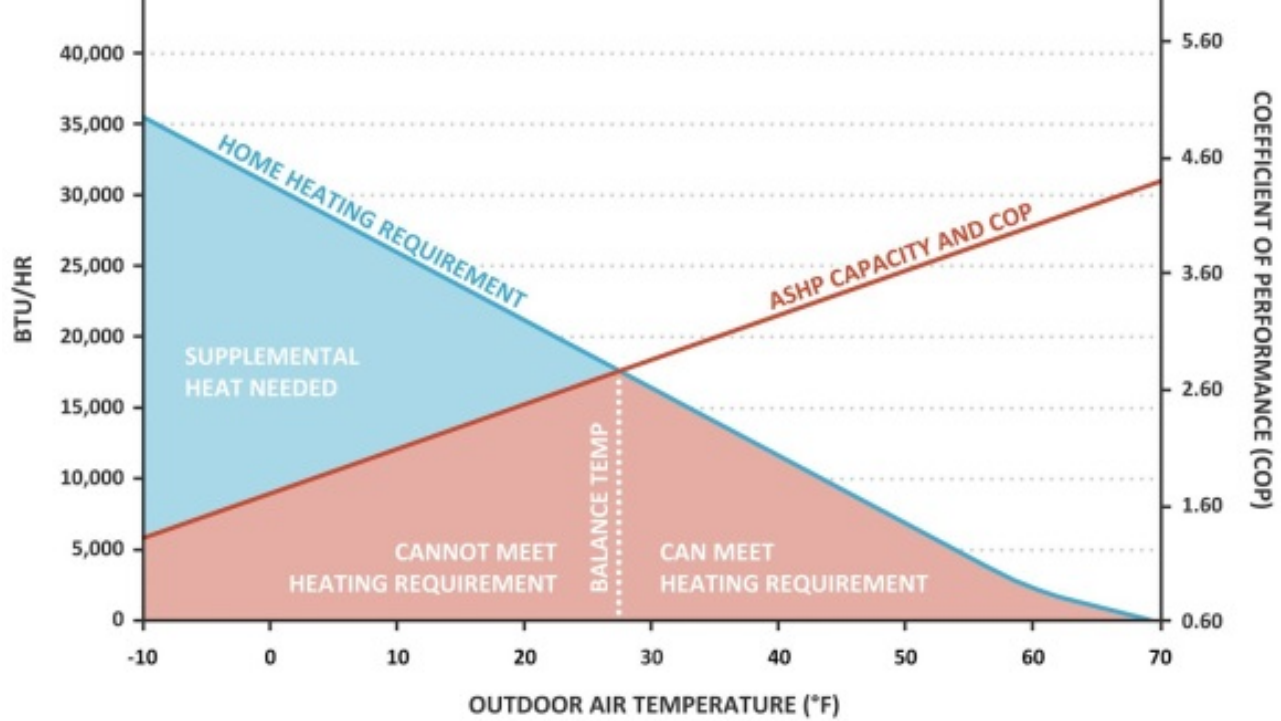
- Power security
- Efficiency
- Sustainability
- Economical



Results | Why solar, biomass combination?

- Power security
- **Efficiency**
- Sustainability
- Economical
- Generation of energy at the right time
- Storage of energy in a thermally insulated vessel
- Allows for delivery of energy when it is needed
- Delivery into an insulated environment
- Efficient technologies

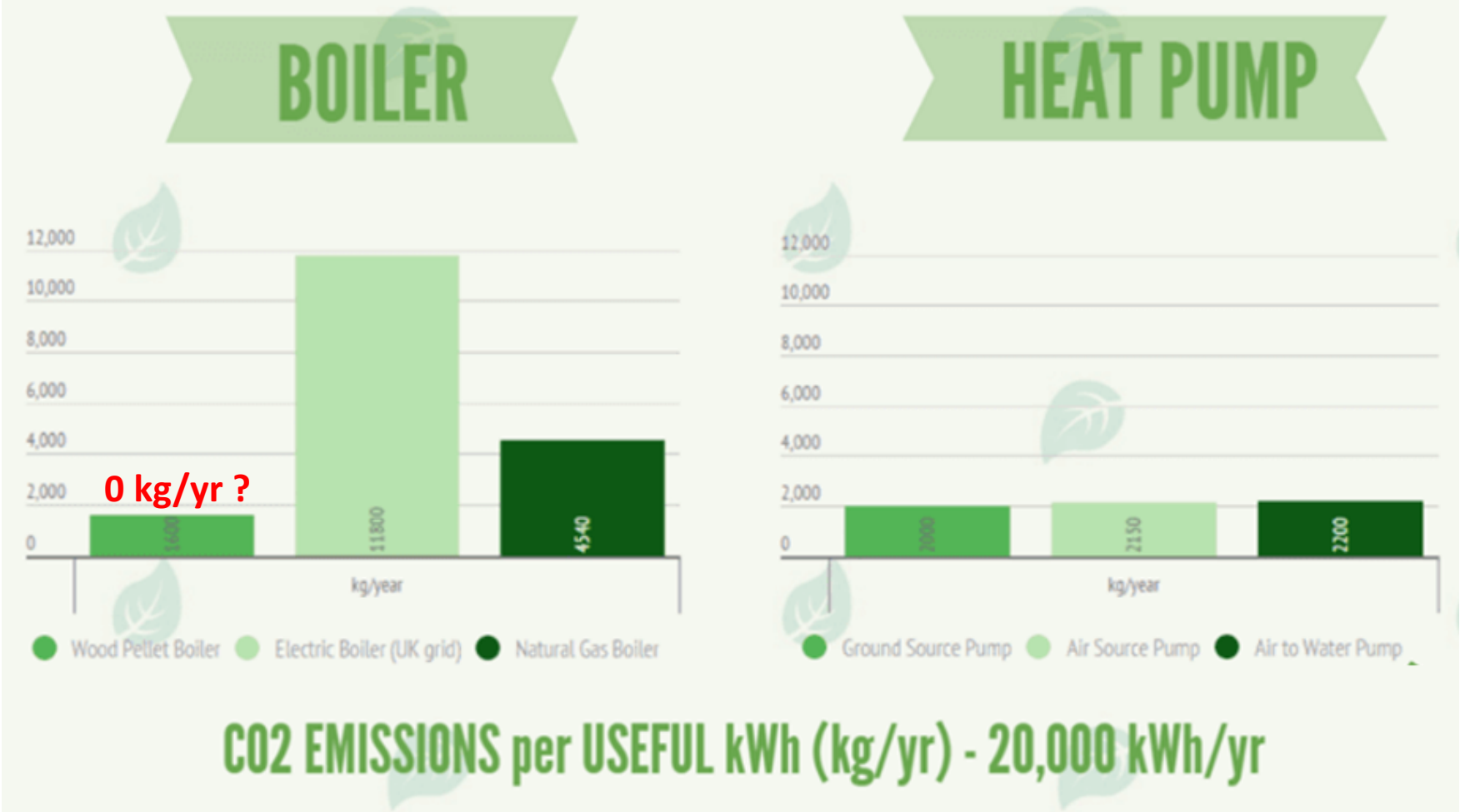
COP versus Temperature (Air to Water Heat Pump)



Source: [WC Online](#)

Results | Why solar, biomass combination?

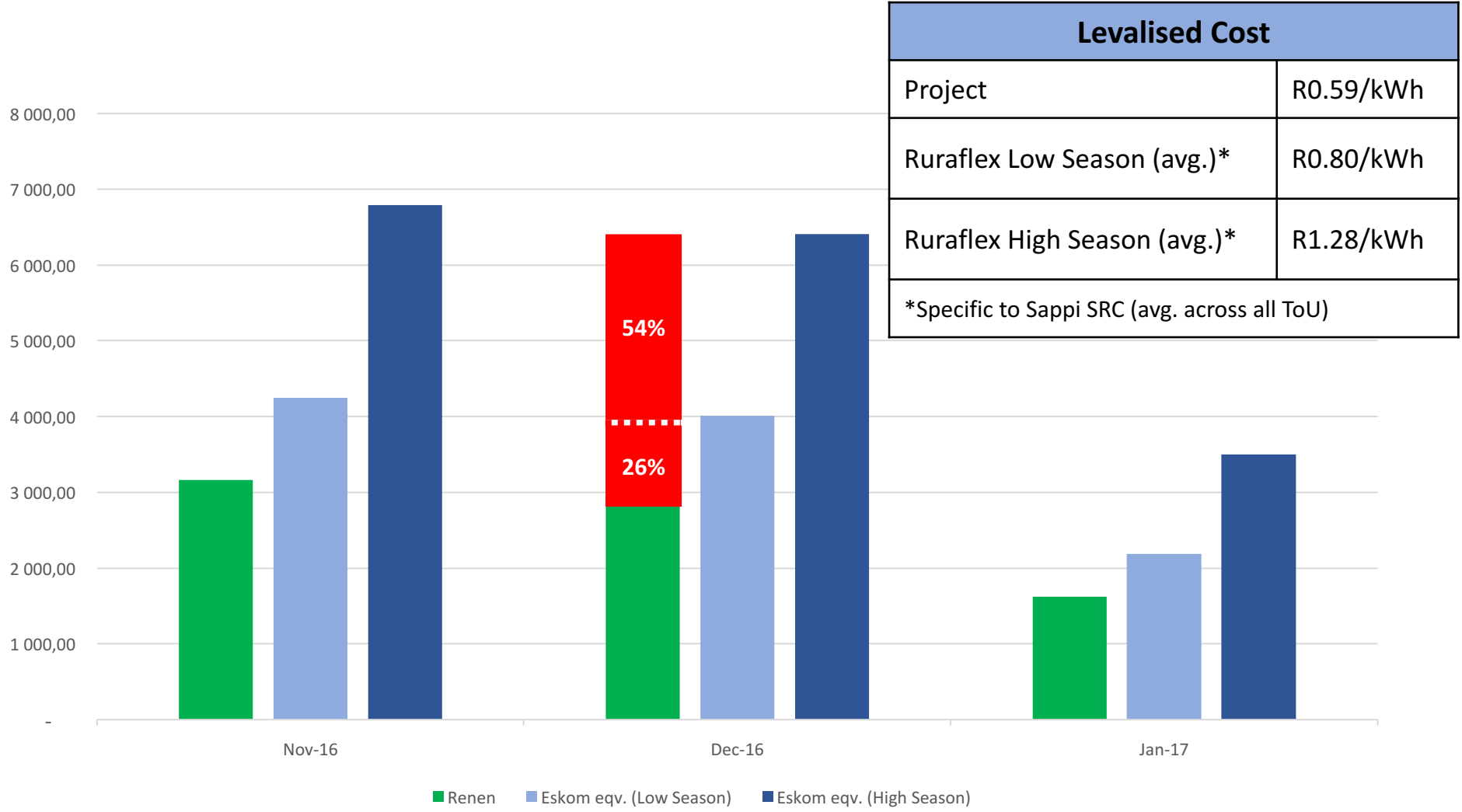
- Power security
- Efficiency
- **Sustainability**
- Economical



Source: [GreenMatch](#)

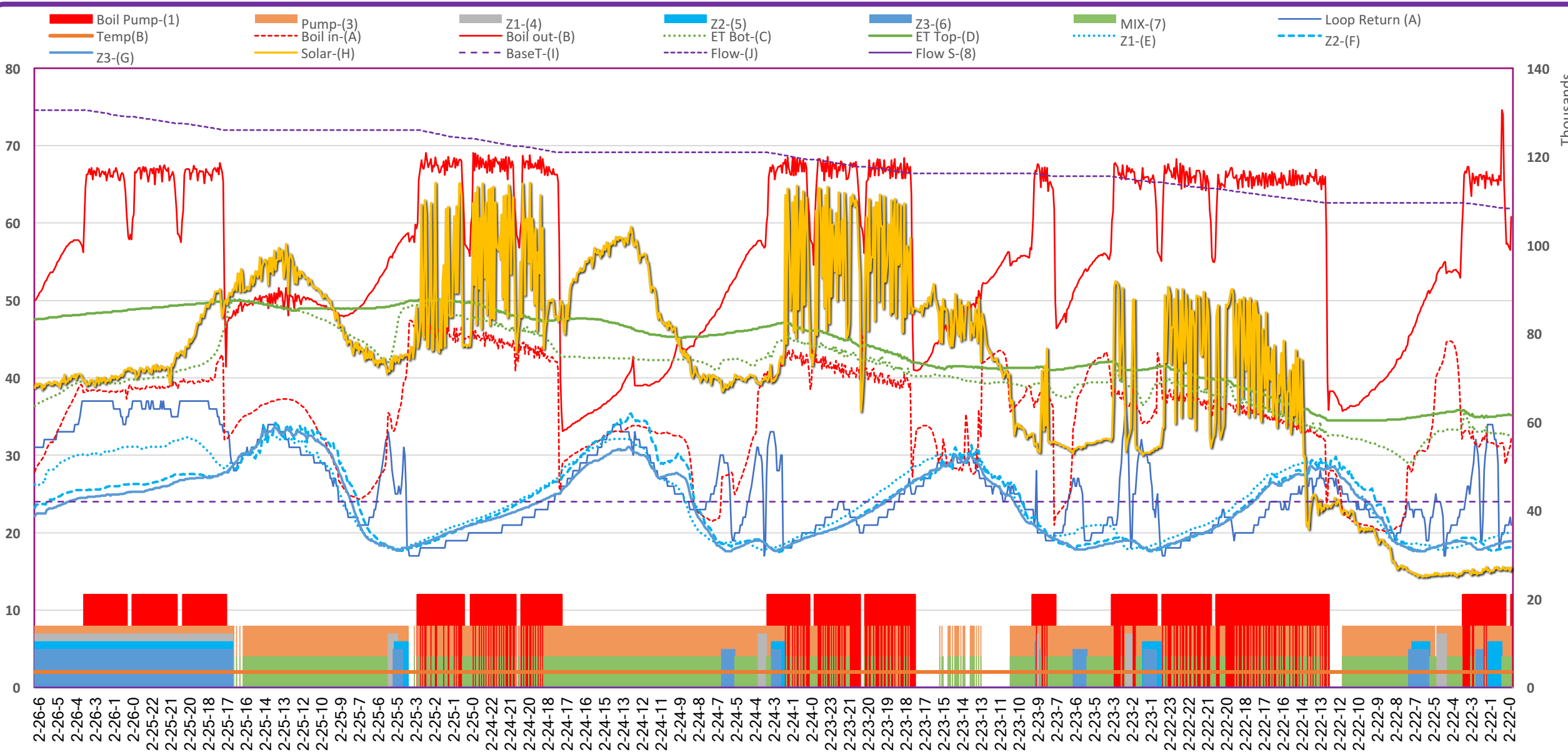
Results | Why solar, biomass combination?

- Power security
- Efficiency
- Sustainability
- **Economical**

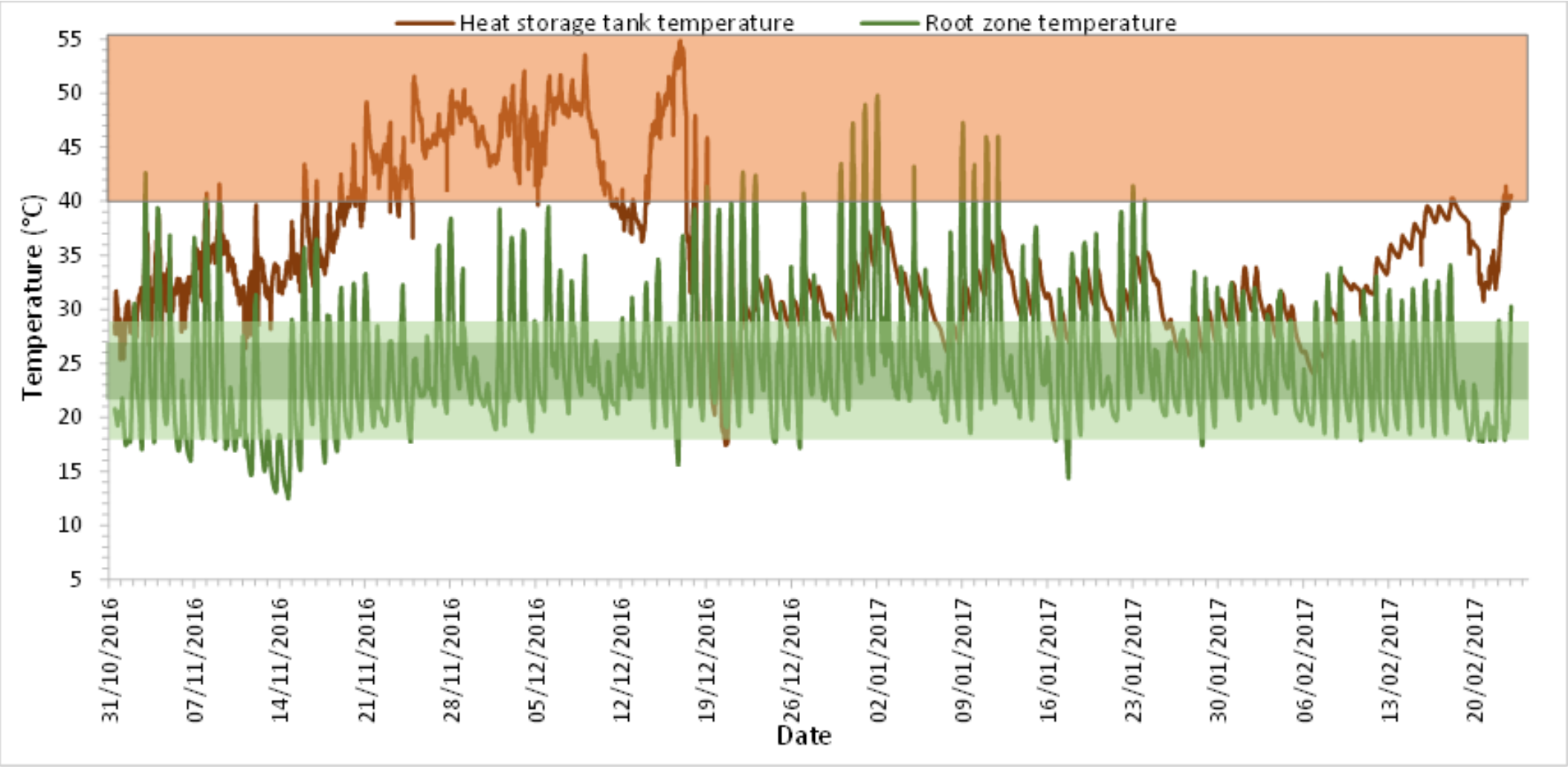


Results

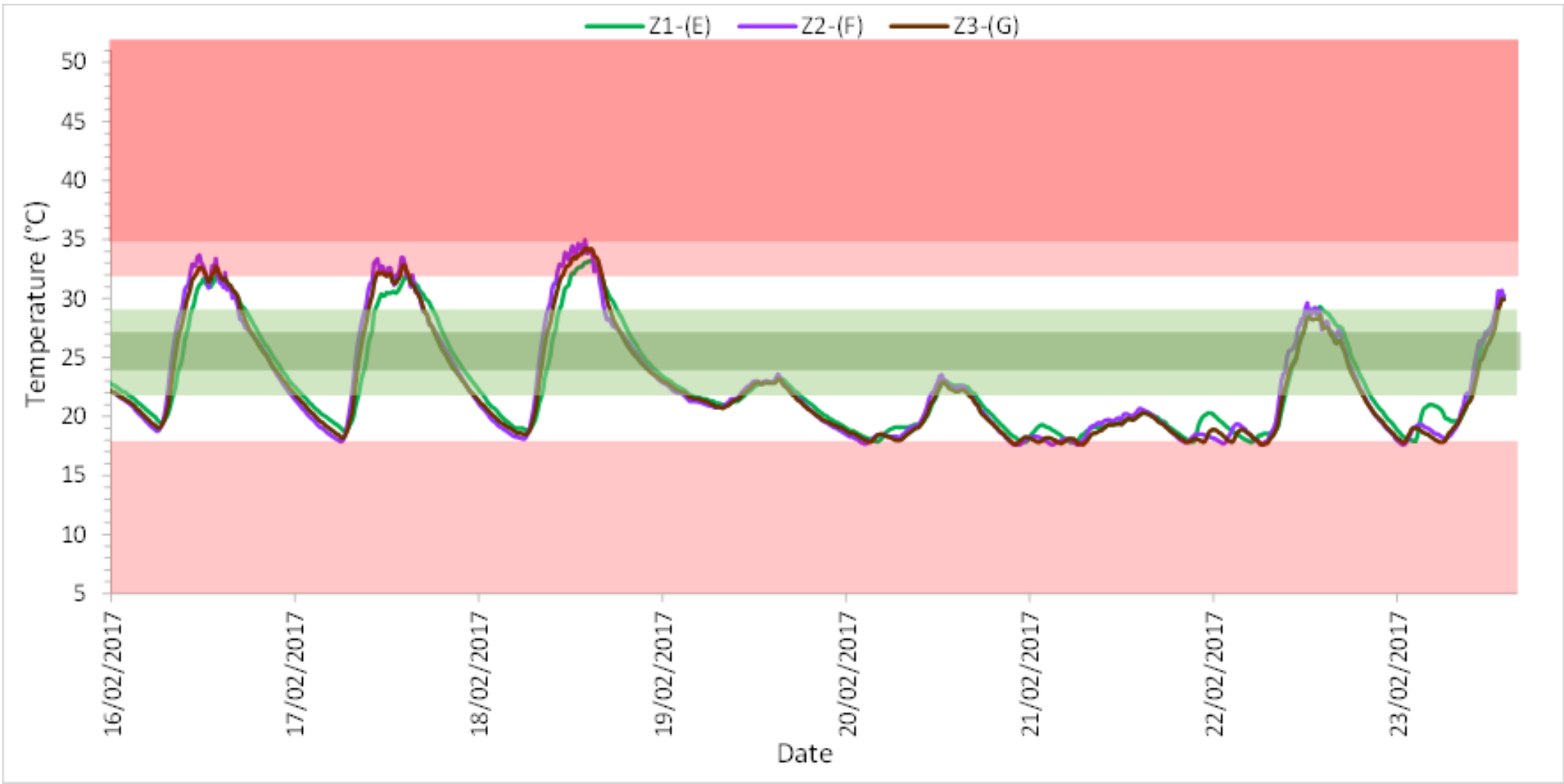
Heating performance



Results | Heating performance



Results | Heating performance



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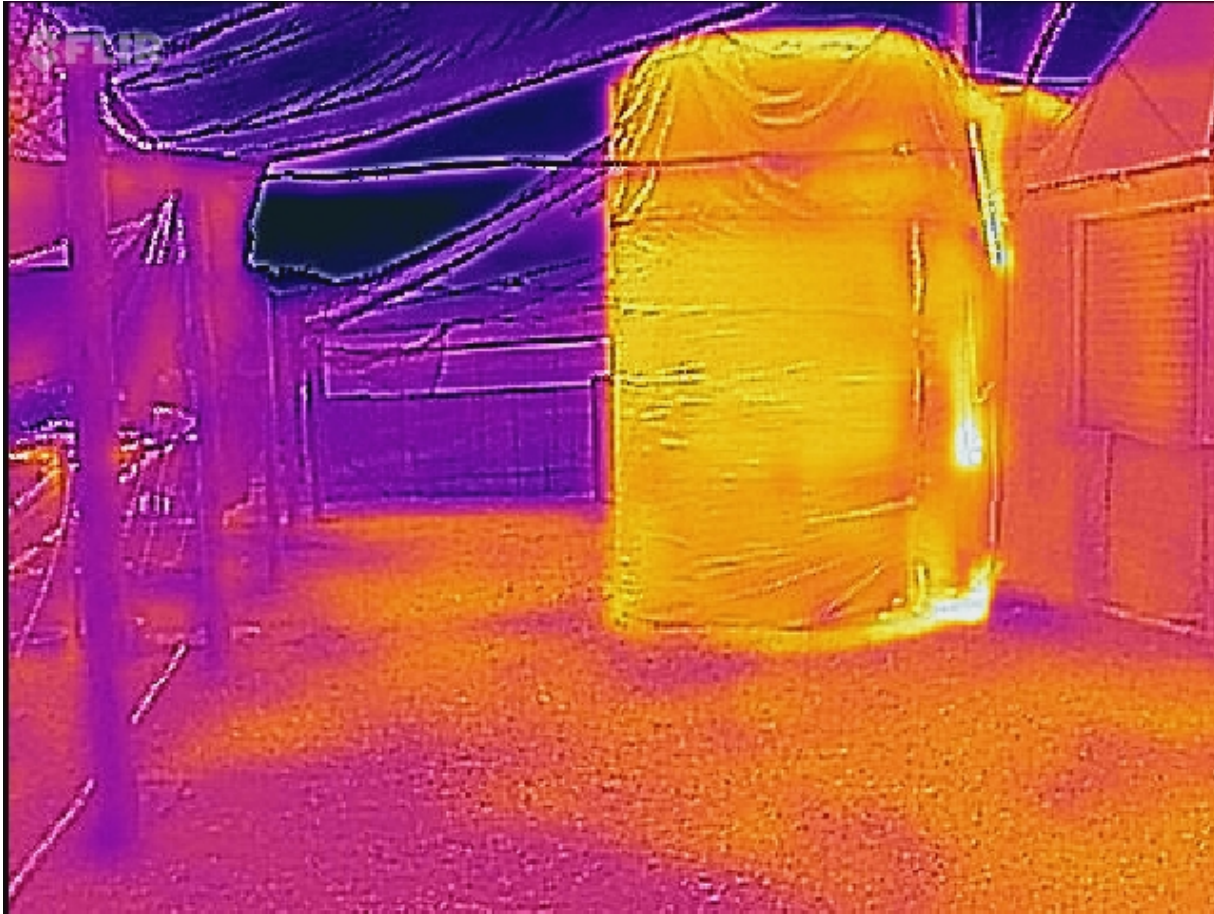
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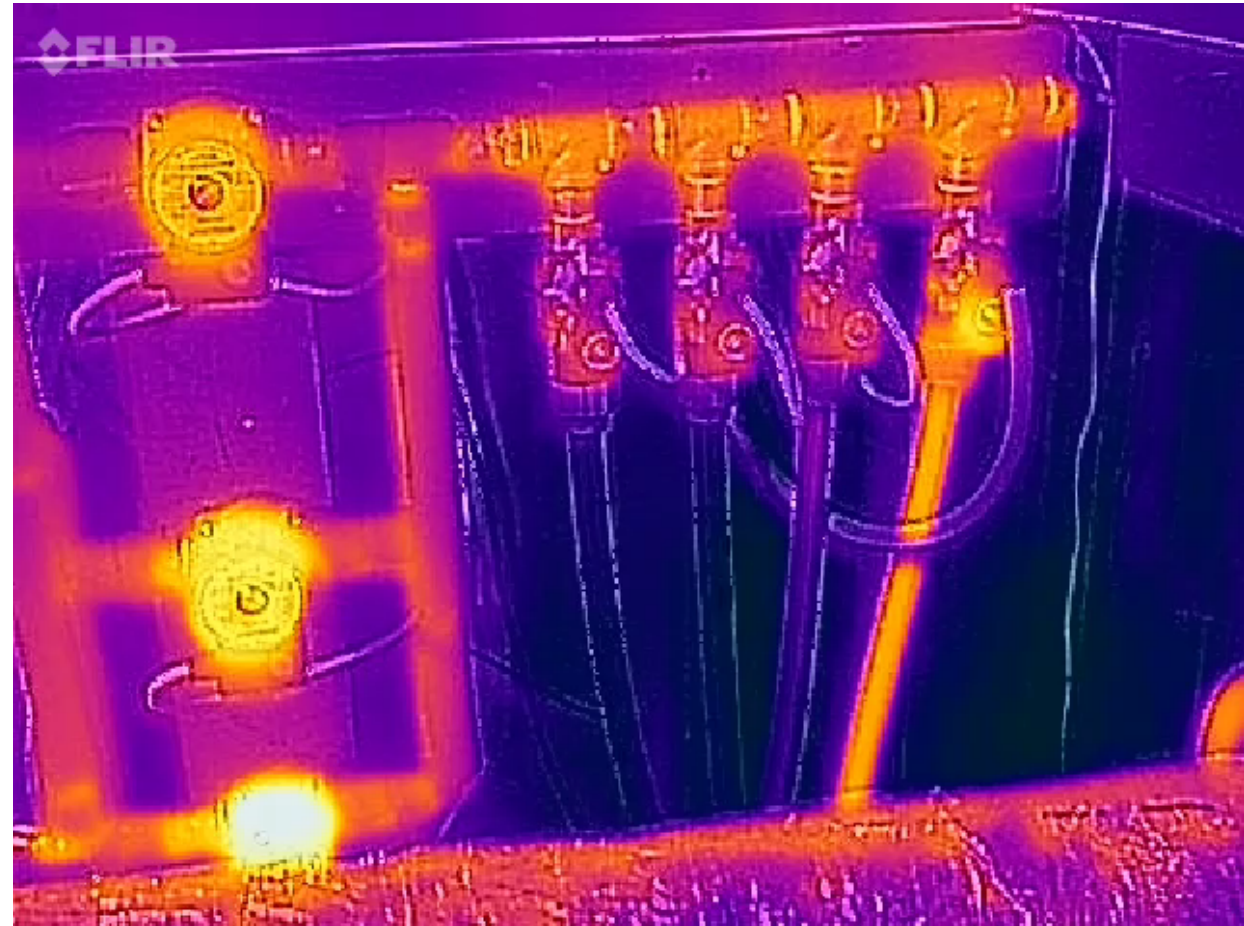
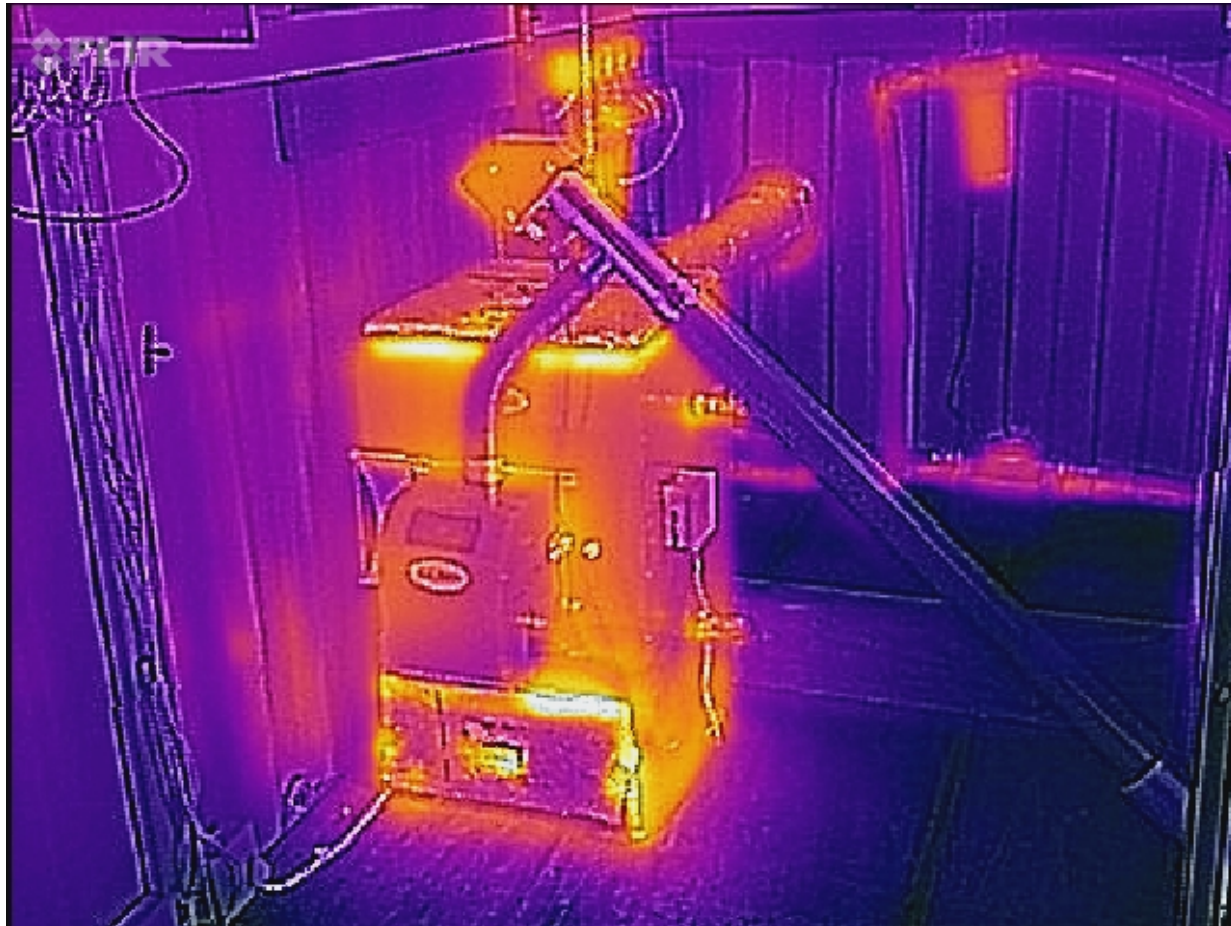
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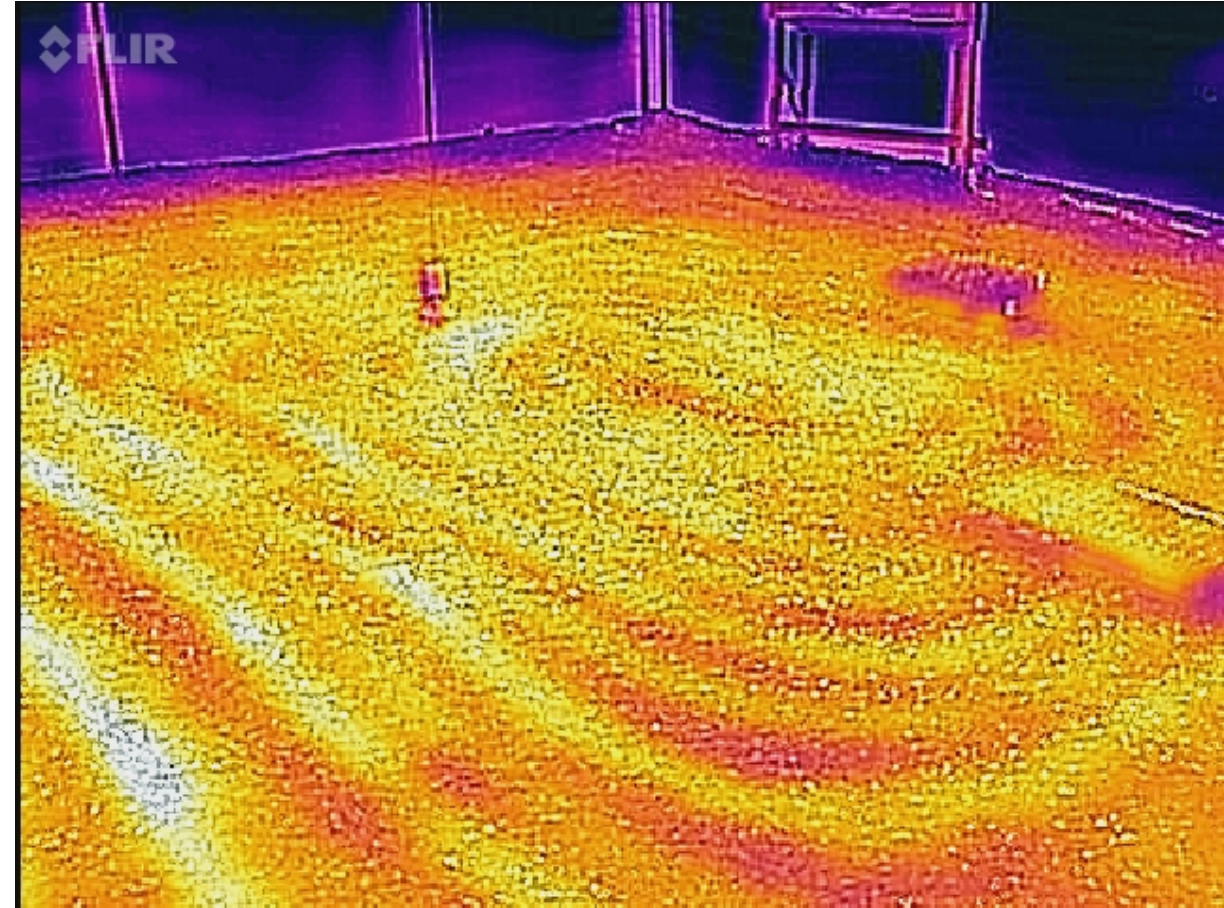
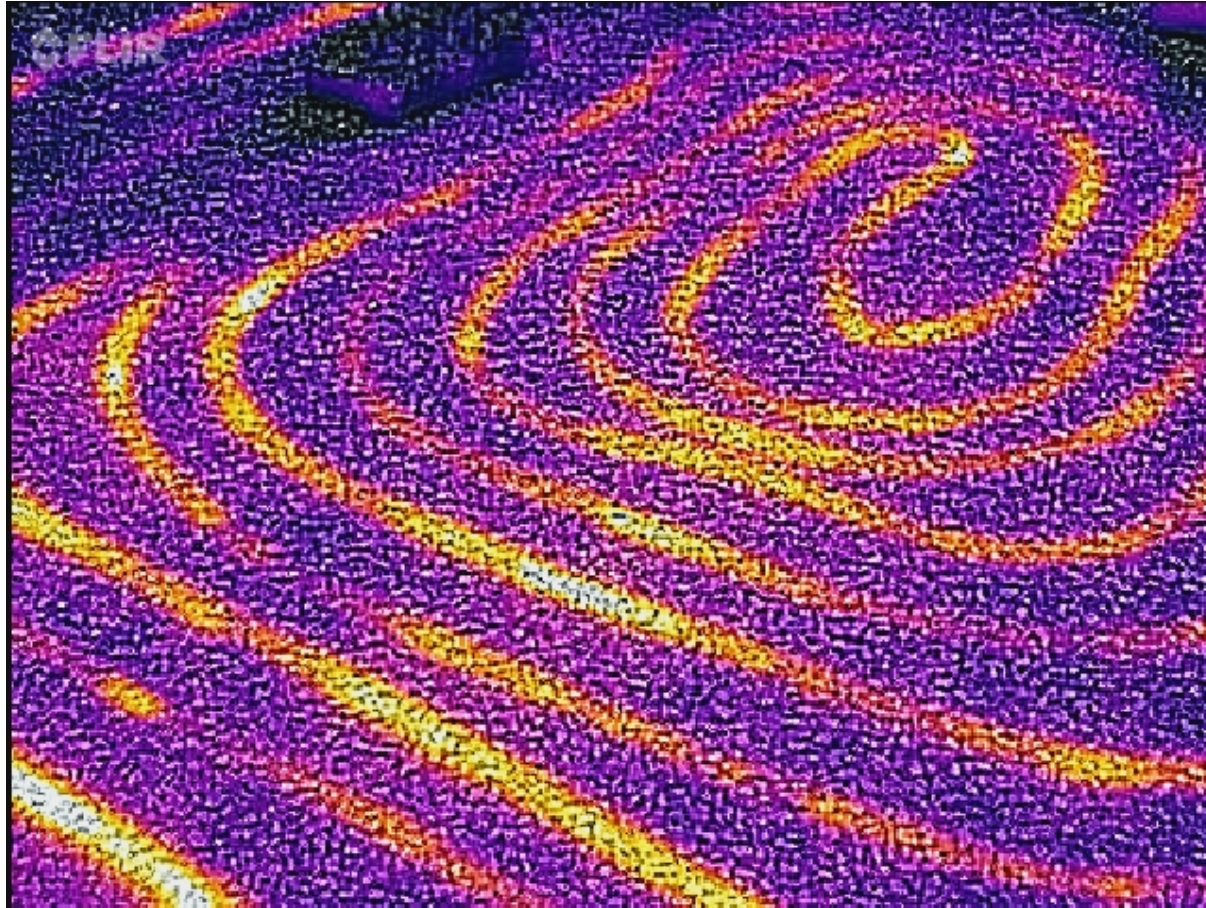
Results | Thermal imagery



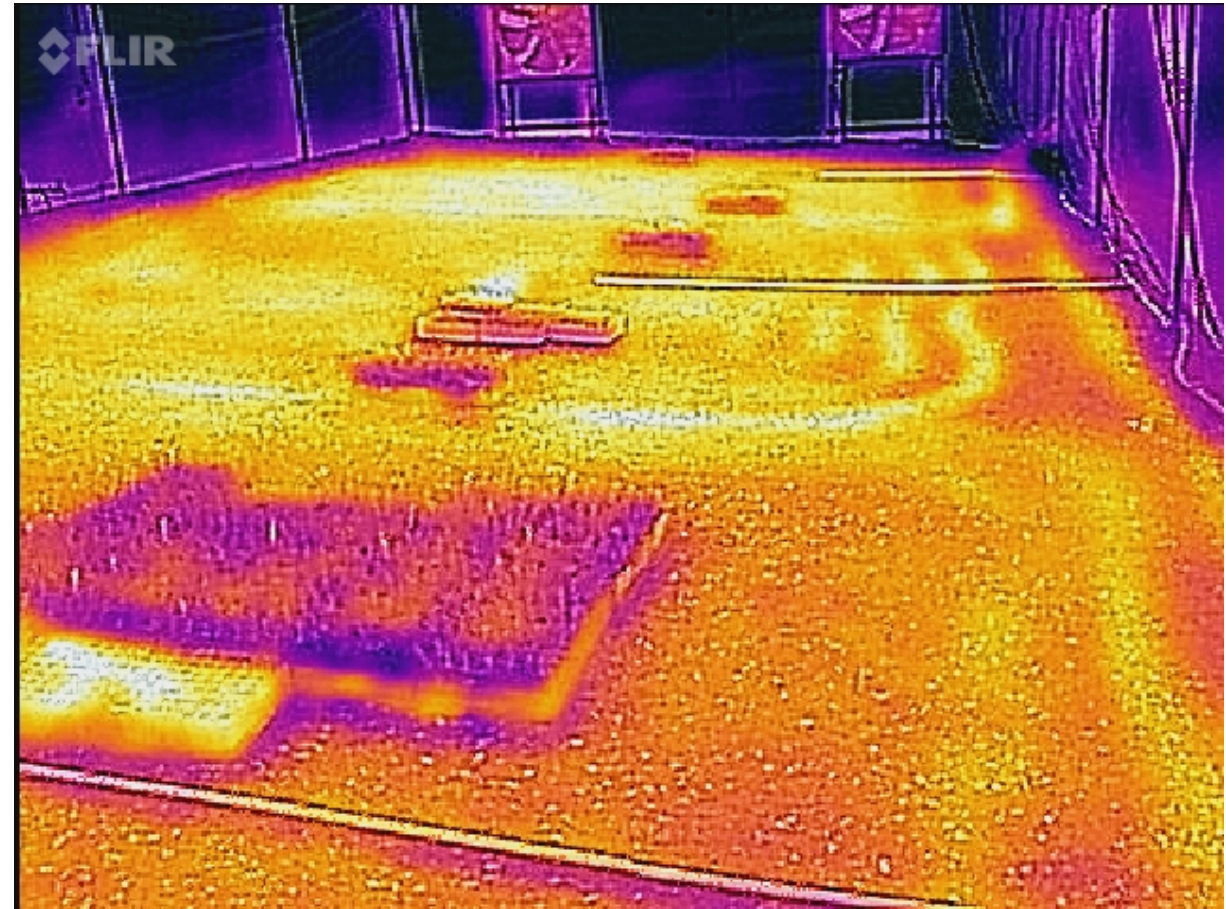
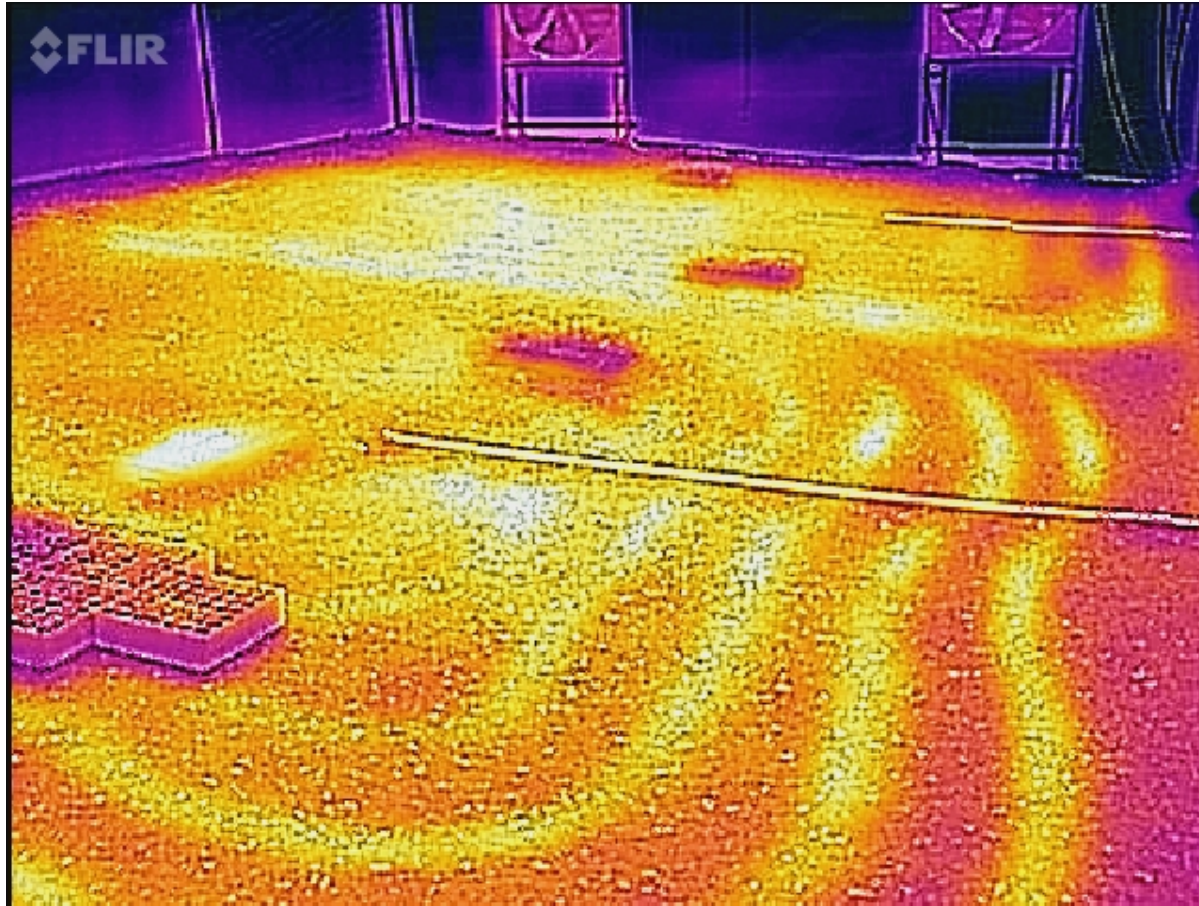
Results | Thermal imagery



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Results | Thermal imagery



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EEP Project 8



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Thank you

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