

# Climate “Roofing” Informal Settlements

*A necessary or debatable measure for building resilience among the urban poor*

Resilient Cities 2019

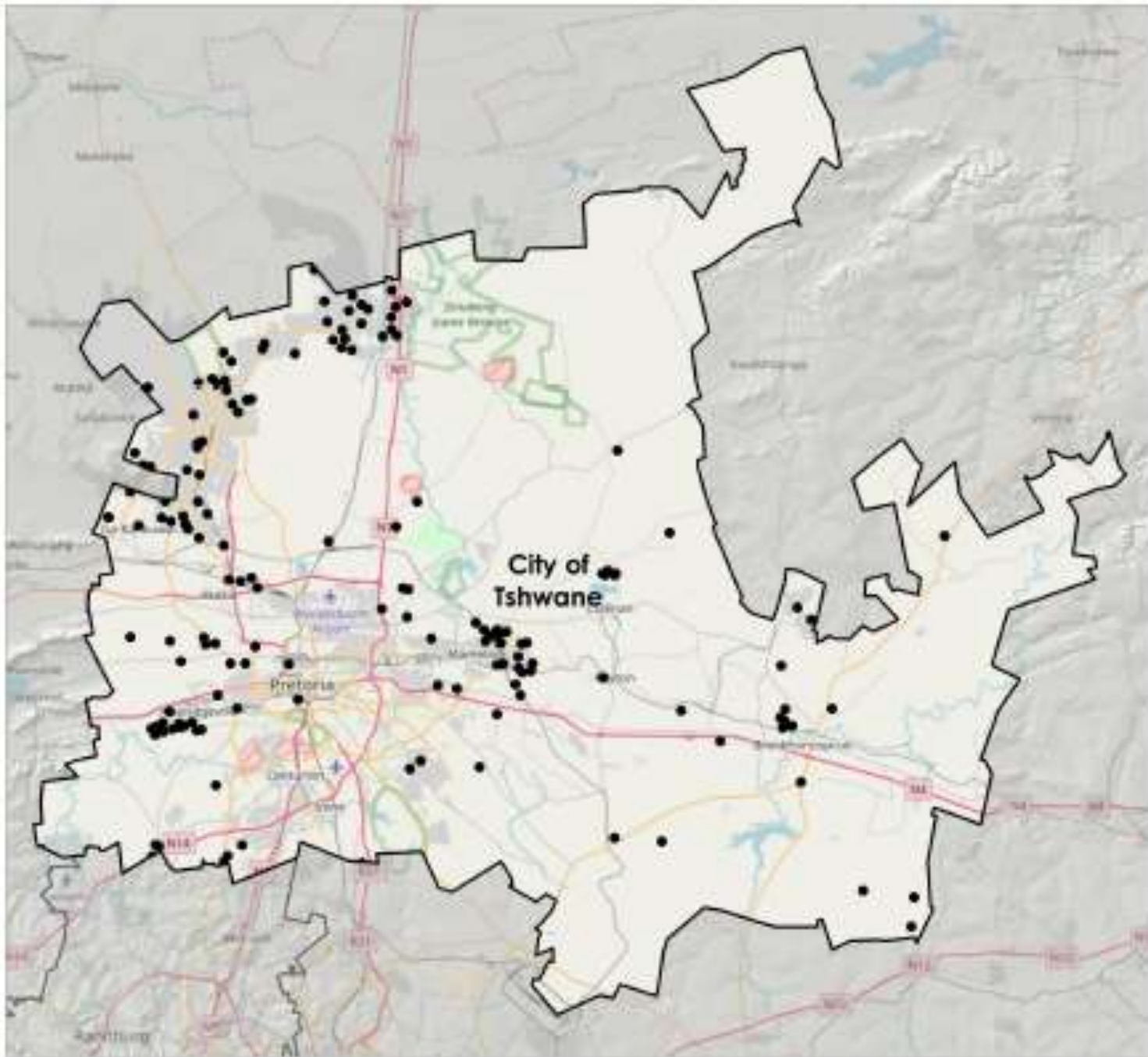
Bonn | 26 June 2019



A place called home



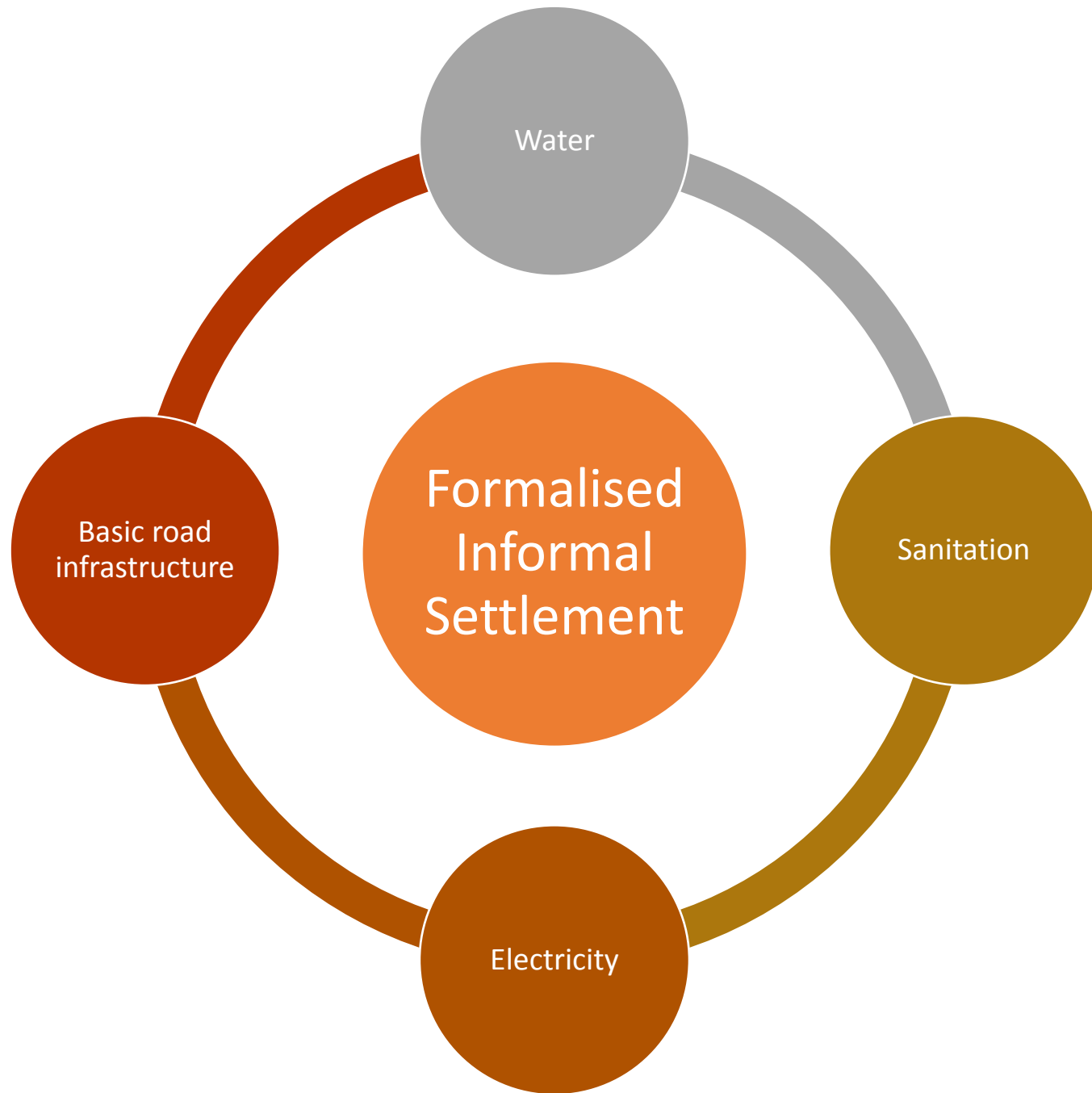
Nellmapius x 22 – formalized informal settlement



**LEGEND**  
City of Tshwane  
● Informal Settlement  
□ Municipal Boundary



158 Informal Settlements  
126 000 households  
Uncontrolled migration, land grabs, densification



# Why heat matters?

## Current Temperature

- **1.8 degrees Celsius**
- the average temperature increase in Tshwane (1961-2010)
- **twice the global rate**

## Future Temperature

- Generally drier conditions and very hot days (max temperature exceeding 35 degrees):
  - 60 days by 2050s
  - Between 100 & 180 days by late 2090s

# Why heat matters?

In the range of 90° and 105°F (32° and 40°C), one can experience heat cramps and exhaustion. Between 105° and 130°F (40° and 54°C), heat exhaustion is more likely. An environmental temperature over 130°F (54°C) often leads to heatstroke.

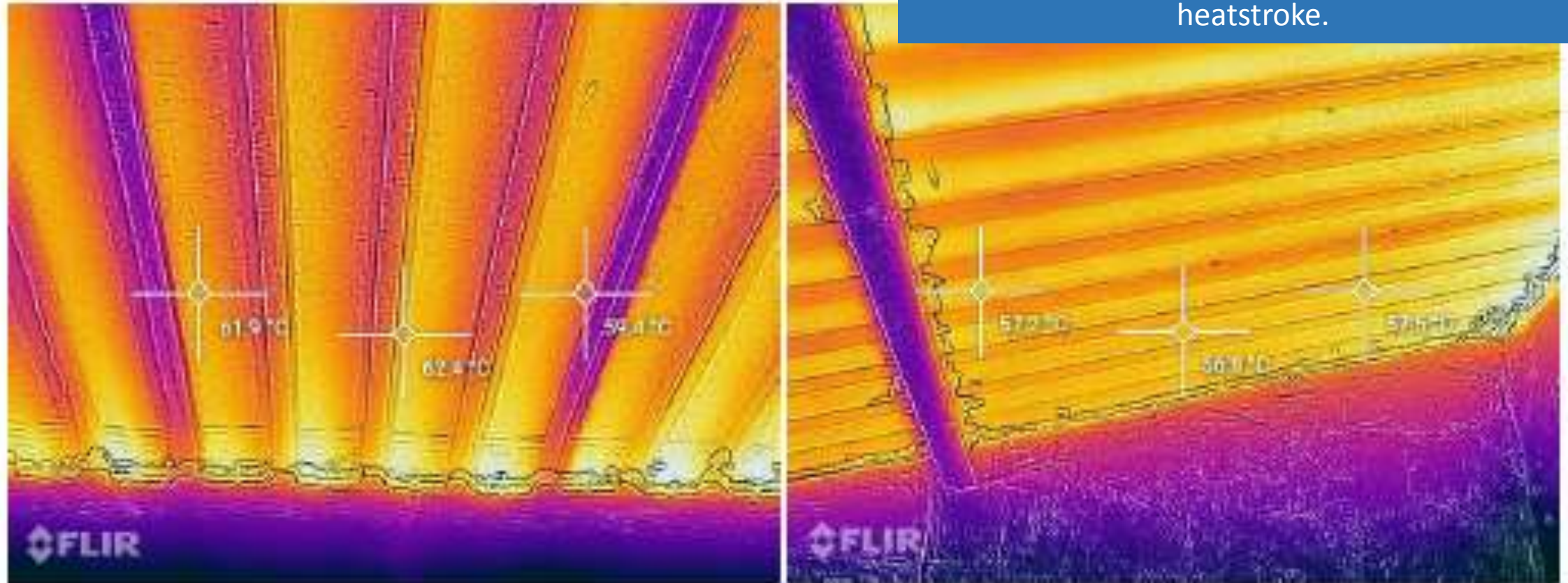


Figure 12. Thermal images of non cool coated roofs

# The Solution

Cool Paints: shack in WP painted and being tested.  
Application on Walls and Roofs



## Cool Surfaces:

- Preparation of structure surfaces
- Application of paint product that contains two basic characteristics
- ***Solar reflectance:*** *Highly reflective (albedo) roof surfaces can reflect refracted solar energy into the atmosphere away from the building interior and the ambient air around the building.*
- ***Thermal emittance:*** *roofs also radiate (emit) back into the atmosphere, a portion of the solar energy that is initially absorbed but not reflected.*

Passive cooling

Minimise urban heat island  
effect

Let's compare

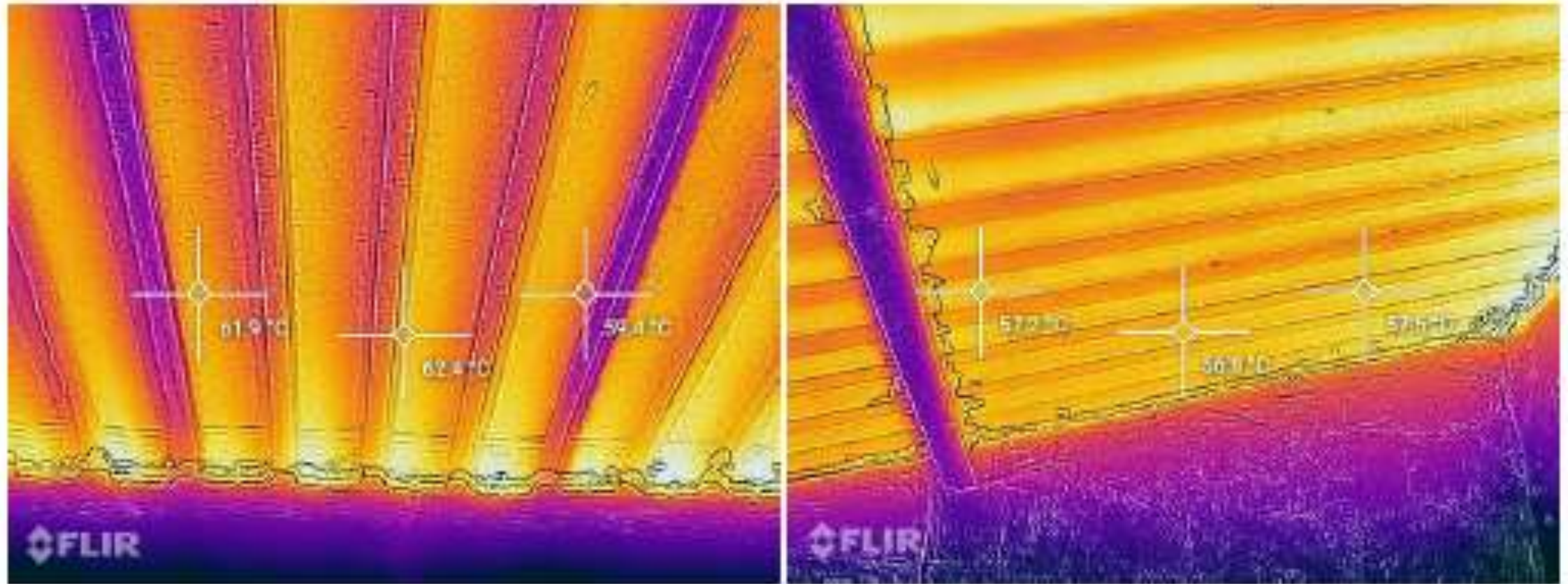


Figure 12. Thermal images of non cool coated roofs



See the difference – physical impact

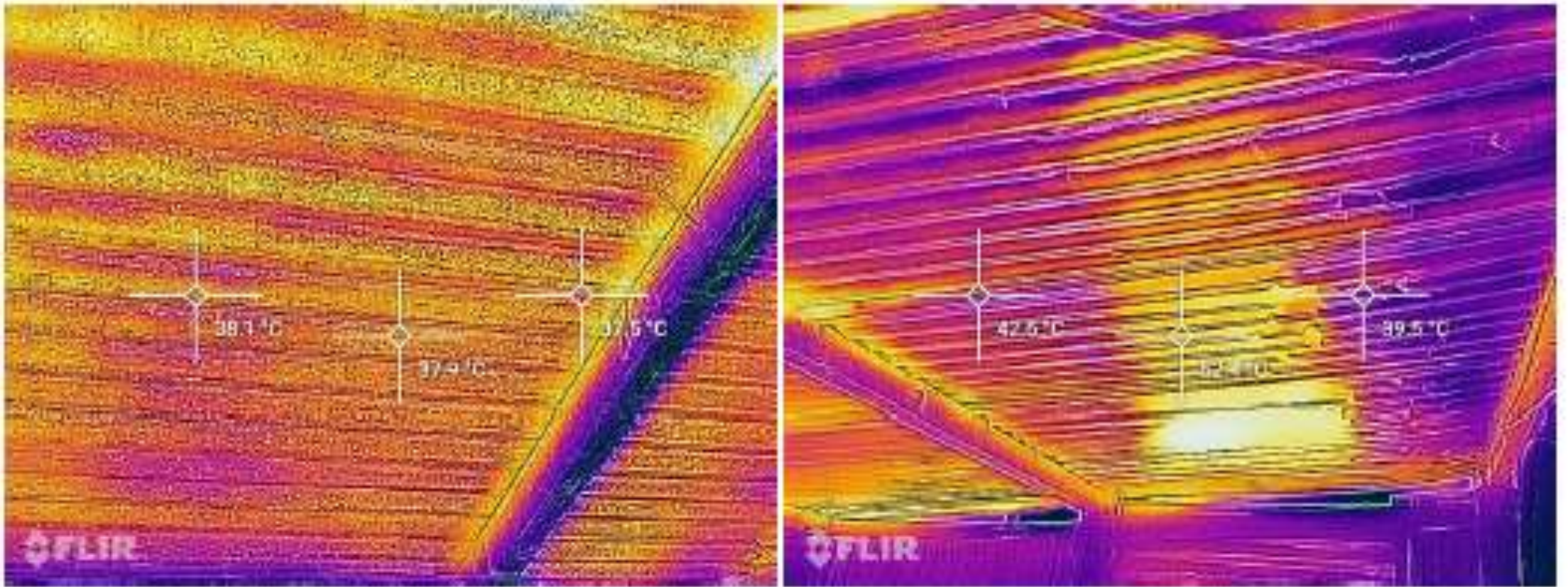


Figure 11. Thermal images of cool coated roofs – the right image shows a section where application is flawed

# Feel the impact - qualitative measure

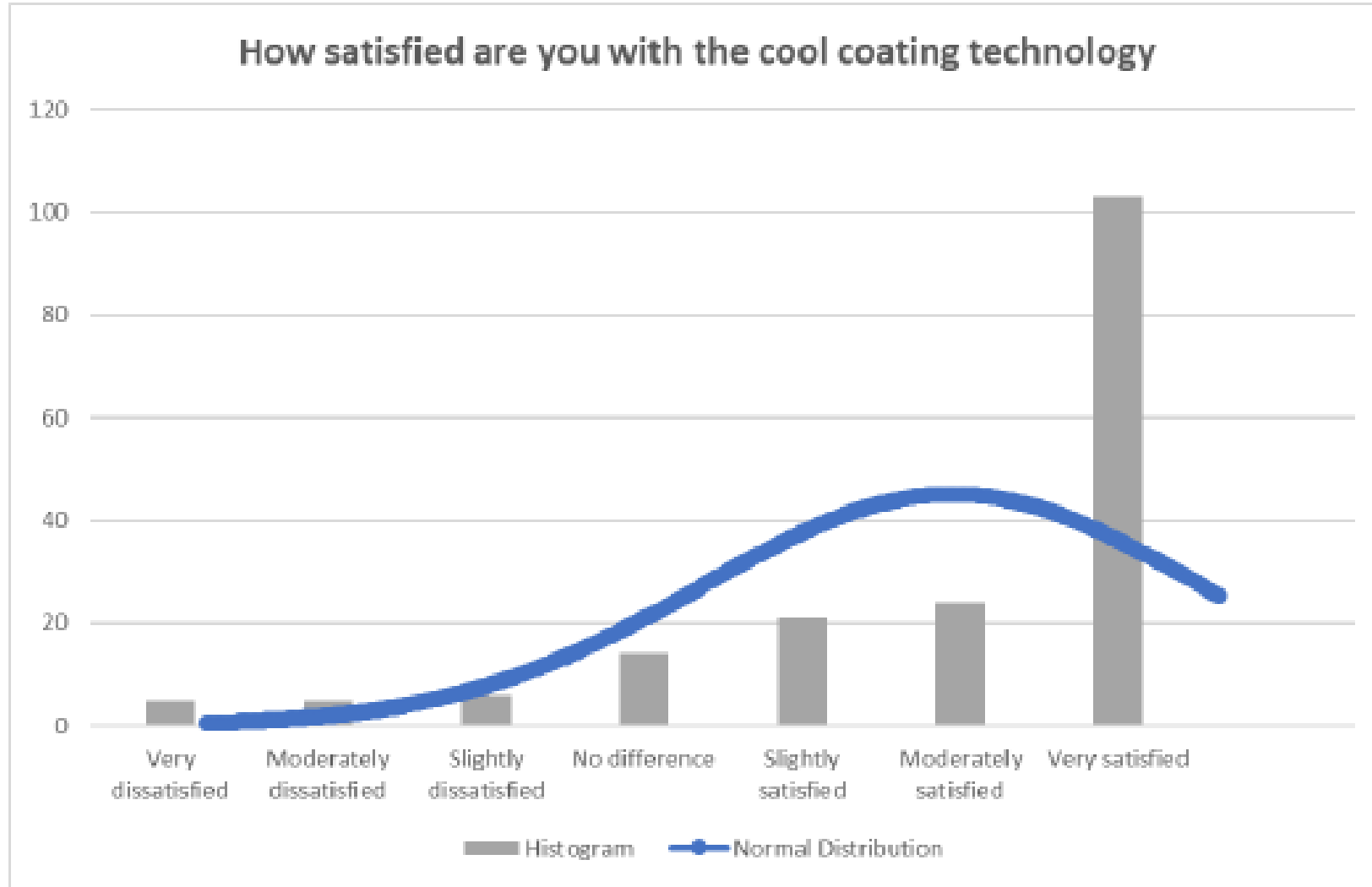


Figure 20: Summary of satisfaction with the cool coating technology.

A place called home or not



“Heat doesn’t matter. We can deal with the heat. We need services. We don’t want these houses. We want those ones next door.”



# Next steps

## Micro-Scale

- Allow services to be implemented
- Train locals in application of product
- Install data loggers in participating homes a few weeks before intervention and in non-participating homes
- Implement measure
- Measure results (quantitative & qualitative)
- Knowledge-sharing

## Macro-Scale

- Present results to relevant provincial and national departments, particularly Treasury and Human Settlements
- Influence National Upgrading Support Programme and RDP Housing Grants
- Develop the industry so that the product becomes widely available in the country

# Partners and Drivers



Cool Cities Network

