

Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung



Partners in Transformation Agentur für Wirtschaft und Entwicklung

# **Cool White**



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### Kigali – Screenshot Google Maps

### **Cool White - Action and Aim**





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**Action:** Coat roofs white of school buildings, company buildings in Rwanda, South Africa, Tanzania and Kenia (until now).

**Aim:** Piloting Cool White to convince decision makers in partner countries, Germany and representatives of the European Union as well as citizens about the positive effects of painting roofs white. A successful pilot will allow us to paint as many roofs as possible in developing countries.

### **Results**



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White coated roofs (metal, previously red, blue, green, black; also other materials such as bitumen, bricks, cement, etc.) **reduce the surface temperature** by about half, **from 60 - 70°C to less than 30°C**. This means that the temperatures in the buildings become bearable again, especially in direct sunlight.



The use of ACs under a white roof can often be completely avoided. Otherwise, the **savings potential is around \$100 / 100 m<sup>2</sup> / month**, taking into account local electricity prices. Applying the paint costs around €450 / 100<sup>2</sup>, payback after around 5 months.



The use of white paint for passive insulation is **cost-effective** and can be **implemented with little effort**, so that even poorer people can benefit from this form of passive insulation.



Use of locally sourced white paint, which has a **reflection level of 90 - 94%**. Depending on the conditions, 1-2% of the radiation is emitted into space through the so-called atmospheric window, which reduces the heating of the earth's atmosphere.



**Improvement of well-being and health**. By reduced temperatures people can sleep better and longer. Health issues caused by heat might be reduced.

# Cool White - Goals (1/3)



### **Goal 1:**

### Noticeable reduction of temperatures in

**buildings** (we want to achieve a reduction of 3-6 degrees Celsius) by using **tested local paints** that are available in the partner countries and that do not harm animals or humans.

On-site coating is carried out as **part of a training project** in cooperation with **local vocational schools**.



Measuring laboratory at PTB Berlin

# Cool White - Goals (2/3)





### **Goal 2:**

### To measure the effect of

white roofs in terms of temperature inside and outside the building

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# **Cool White**







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### **Cool White**





Effect of white roofs in terms of temperature inside and outside the building

#### © Rwanda Standard Board

# Cool White - Goals (3/3)





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Goal 3:

**Explaining Island heat effect**: Around 35 degrees difference in temperature, and this in a way that it is understood by the target group

Island Heat effect - curbs.

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### **Cool White - Effects**





### Effect 1:

Reflection of heat radiation on the base of the white colour. Temperature difference on the surface of up to  $50^{\circ}$ C.

### Effect 2:

Radiation of heat into space (atmospheric window).

### Measuring devices: Roofs in Rwanda



### Testo 176 T1

- Temperature data logger



# Testo 175 H1

- Temperature and humidity data logger





# Cool White Goals (3/3)





Difference: 38,2°C



Unpainted: 63,9°C



Painted: 25,7°C

# Cool White - Goals (3/3)





Explain the effects in a way that it is understood by the target group

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### **Cool White – Team in Germany**









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