

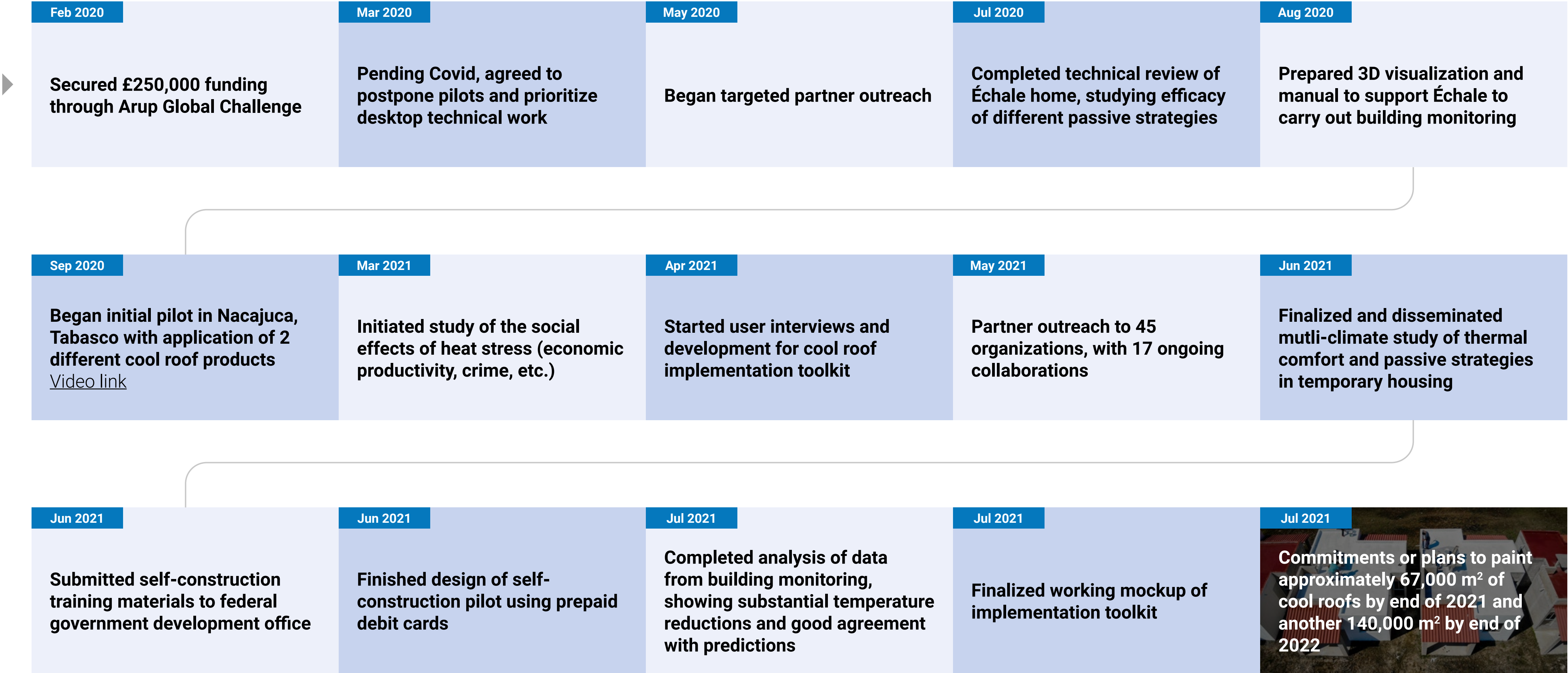
← BACK

# Project summary





# Project timeline



# Team and partners overview

## CORE TEAM

**ARUP**  
A global independent firm of designers, planners, engineers, architects, consultants and technical specialists, working across every aspect of today’s built environment. For several years Arup have been conducting research into novel materials for passive cooling, and consequently have deep expertise on the topic

**ÉCHALE**  
Échale are the largest social housing constructor in Mexico, with 30.000 new houses built and 150.000 house improvements made as of 2016. They have longstanding relationships with communities where they work and have won multiple awards for their work.

**NEW STORY**  
Sector leaders in the development of best practice design strategies, business models, and technoogies to alleviate the crissis of global homelessnes. Through their learnings, New Story share their best practices with other non-profits, NGOs, and ministries of housing globally to impact affordable housing practices. New Story’s tools have been adopted by over 75 organisations on four continets.

## PARTNERS

**LIVE PROJECTS**  
*We are working on live projects to advance Cool Roofs with the following partners*

- 4B
- Coordinación Nacional de Autoproducción
- Global Cool Cities Alliance
- TECHO

**ONGOING ENGAGEMENTS**  
*We are discussing potential collaborations with the following partners*

- GIZ
- Cemex
- Cemex-Tec
- FCDO - UK PACT
- Habitat for Humanity
- Habvita
- INFONAVIT
- Mejoremos
- MSF Mexico
- Tec de Monterrey
- Universidad Autonomia de Ciudad Juarez
- Universidad de Guadalajara
- Walmart

**CONNECTIONS**  
*Our network of connections includes the following partners, and others*

- Duratherm
- Global Resilient Cities Network
- Consorcio ARA
- La Oficina de Resiliencia en Ciudad Juarez
- Unidad Diseño



# Project summary in numbers

## ROOF AREA

Roofs painted/  
underway:

92

We completed cool roof installations on 65 homes in Nacajuca, and our self-construction pilot in Totolapan includes 27 families.

Square meters painted/  
underway:

4,600

Square meters commitments /  
in planning, by  
end 2021:

67,000

Our completed projects and projects in development will covering nearly 67,000m<sup>2</sup> by the end of this year. Most installations will be on homes for low-income families, internally displaced people, and migrants.

Number of states  
in Mexico where  
we have projects  
planned or  
underway:

8

We have projects underway or planned with partners in eight states: Tabasco, Sinaloa, Morelos, Guanajuato, Chiapas, Quintana Roo, Veracruz, Tamaulipas

Square meters commitments /  
in planning, in  
2022:

140,000

Échale plans to complete cool roof installations on 4,500 new homes in 2022, benefiting 18,500 people and covering 140,000 m<sup>2</sup>.

## NACAJUCA PILOT

38% 12%

Children (under 10)

Seniors (over 55)

The community supported in our Nacajuca pilot includes about 500 people, half of whom are children (38%) or seniors (12%).

Monthly median  
income (USD):

\$136

The community has a median monthly income of about 3,000 pesos, or about USD \$136.

Number of  
workers hired to  
support pilot:

16

16 workers were hired to carry out the installations on 65 homes.

4 Different cool  
roof products  
tested

We tested 4 different cool roof products: GAF RoofMate, BlackJack EternaKote, Topps Commercial WB, and MS Thermashield.

Number of  
sensors installed  
on all buildings:

46

We installed 46 temperature sensors across 5 buildings to measure the physical performance of cool roofs.

## FUNDING PATHWAYS

Switching  
to cool roof  
waterproofing  
layer: **upfront  
savings:**

15%

By switching to a waterproof-certified cool roof product for all new construction, Échale expects to save 15% on the upfront cost of waterproofing.

Switching  
to cool roof  
waterproofing  
layer: **lifetime  
savings:**

50%

And, since the new product is rated to last nearly twice as long as the old one, the new product is half the price over its lifetime.

Number of families  
engaged in self-  
construction pilot:

27

We have engaged 27 families in Totolapan, Morelos, supporting them with training and direct funding to support them to self-construct cool roofs.

Number of users reached by  
Decide y Construye:

90,000+

Our training materials for self-constructors will be hosted on the Mexican federal government website 'Decide y Construye', which reaches more than 90,000 users.

## FUNDING AND TEAM SUPPORT

Total value of time contribution

\$400,000

5,000  
HOURS

5000 hours donated by the three core partners: Arup, Échale and New Story

Amount of  
grant spent  
in Mexico:

90%

Our project team spent 90% of the \$125,000 grant award in Mexico. Includes spend to date and planned spend.

## PARTNER OUTREACH

Partners  
contacted:

45

We have contacted 45 organizations across the public and private sectors in Mexico to promote our project and foster collaborations.

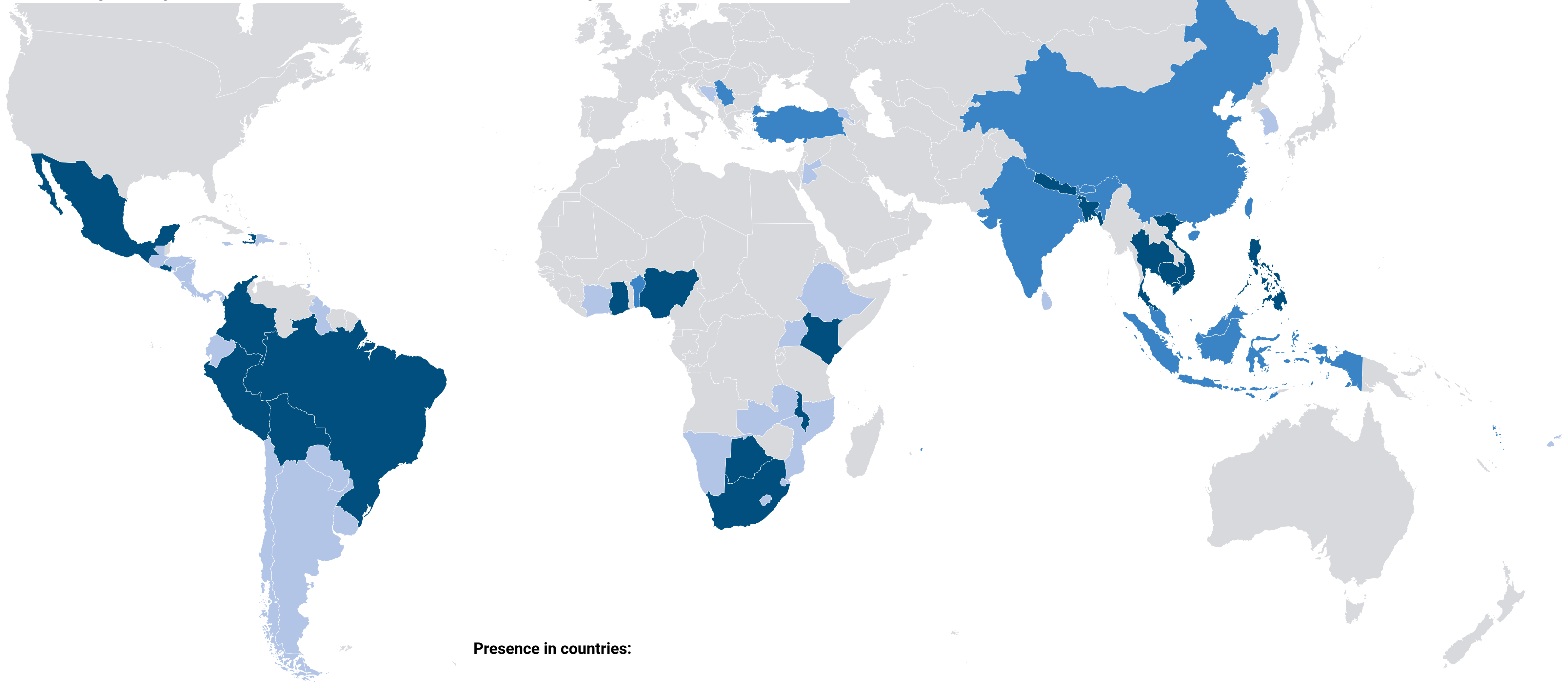
Partners  
in ongoing  
collaborations:

17

We have ongoing collaborations with 17 of them.



# Our geographical presence in eligible countries



Presence in countries:

- Partner experience/office
- Core team experience/office
- Both



# List of projects and locations

- 4

**Location:** Ocuituco, Morelos

**No. buildings:** 85

**M²:** 4,250

**Partner(s):** Échale
- 5

**Location:** Tlaltizapan, Morelos

**No. buildings:** 100

**M²:** 3,200

**Partner(s):** Échale
- 6

**Location:** Emiliano Zapata, Morelos

**No. buildings:** 63

**M²:** 2,600

**Partner(s):** Échale
- 7

**Location:** Escuinapa, Sinaloa

**No. buildings:** 60

**M²:** 1,600

**Partner(s):** Échale
- 8

**Location:** Guanajuato, Chiapas

**No. buildings:** 20

**M²:** 800

**Partner(s):** Habitat for Humanity, GIZ
- 9

**Location:** Tabasco, Quintana Roo

**No. buildings:** TBC

**M²:** 20,000

**Partner(s):** Habvita

- 10

**Location:** Ciudad Juarez, Chihuahua

**No. buildings:** 50

**M²:** 2,500

**Partner(s):** Univ. Auto. Cd. Juarez
- 11

**Location:** Tenosique, Tabasco

**No. buildings:** 497

**M²:** 24,850

**Partner(s):** Échale
- 12

**Location:** Reynosa, Tamaulipas

**No. buildings:** 3

**M²:** 650

**Partner(s):** MSF
- Location:** Various states

**No. buildings:** 4,500

**M²:** 140,000

**Partner(s):** Échale

(Planned for 2022)

**Location:** Jojutla, Morelos

**No. buildings:** 90

**M²:** 2,300

**Partner(s):** Échale

**Pilot - coordinated construction - new construction**

Using dual purpose cool roof + waterproofing layer. Achieving upfront cost reductions and roof lifetime extension.

**Location:** Totolapan, Morelos

**No. buildings:** 27

**M²:** 1,350

**Partner(s):** Échale, Cemex

**Pilot - self-construction**

Engaged with community leaders to build support for pilot. Distributed prepaid debit cards to families to buy cool roof materials and tools. Provided training to enable self-construction.

**Location:** Nacajuca, Tabasco

**No. buildings:** 65

**M²:** 3,250

**Partner(s):** Échale, New Story

**Pilot - coordinated construction - retrofit**

Tested 4 different cool roof products and measured impact through family surveys and building monitoring.

**Project stages:** Completed Underway Planned 2021 Preliminary development



# Community-scale implementation

## Quotes from locals on the problem of heat stress:

“ My family gets sick very often because it is too hot inside the house and we also can’t sleep.”

Local woman, Jojutla de Juárez, Morelos, Mexico



Community outreach



Applying the base coat

“ The heat spoils our food and we get sick too.”

Local woman, Zacatepec de Hidalgo, Morelos, Mexico



Comparing two products

“ Tabasco is hot and we are suffering because of roofs from steel sheets. It’s too hot inside the house. My wife has diabetes and the extreme temperature increases her blood pressure. ”

Local man, Nacajuca, Tabasco, Mexico



Preparing to install



# Impact: measured data vs modelling predictions

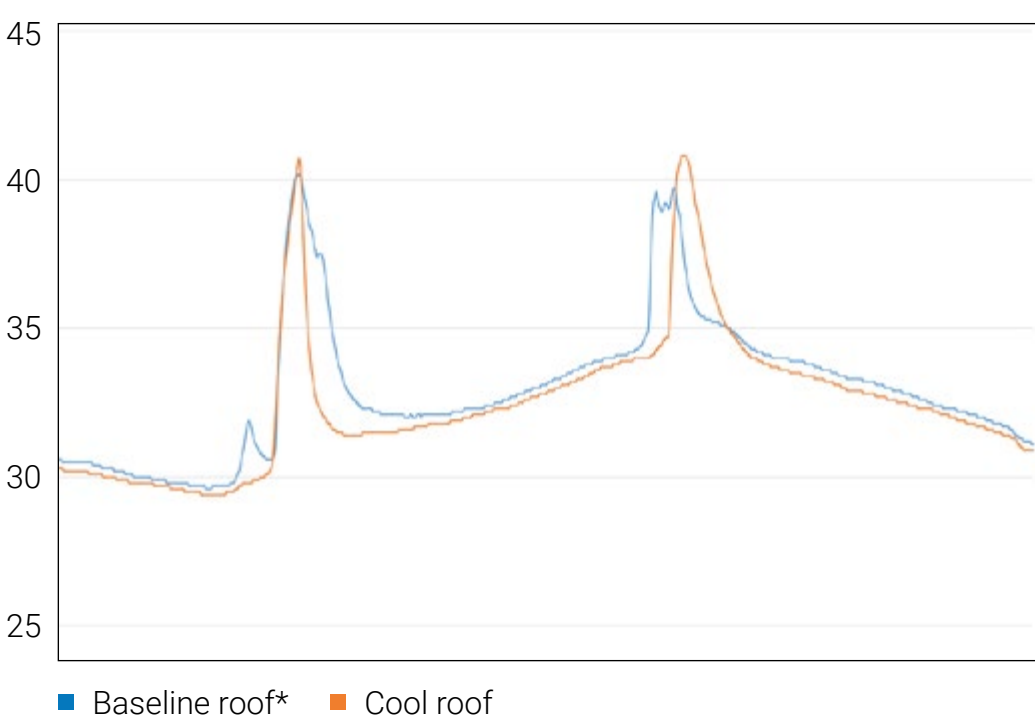
**Conclusion:** Our predictions were accurate and the difference between predictions and measured data was very small. This gives us confidence in our prediction software and the accuracy of our future predictions. (see below for details)

## Air

*In bedroom, suspended in air at approximate height of 1100mm*

### DIFFERENCE

**Average:** -0.4 °C  
**Also observed:** lack of window covering results in 10C spikes from sun

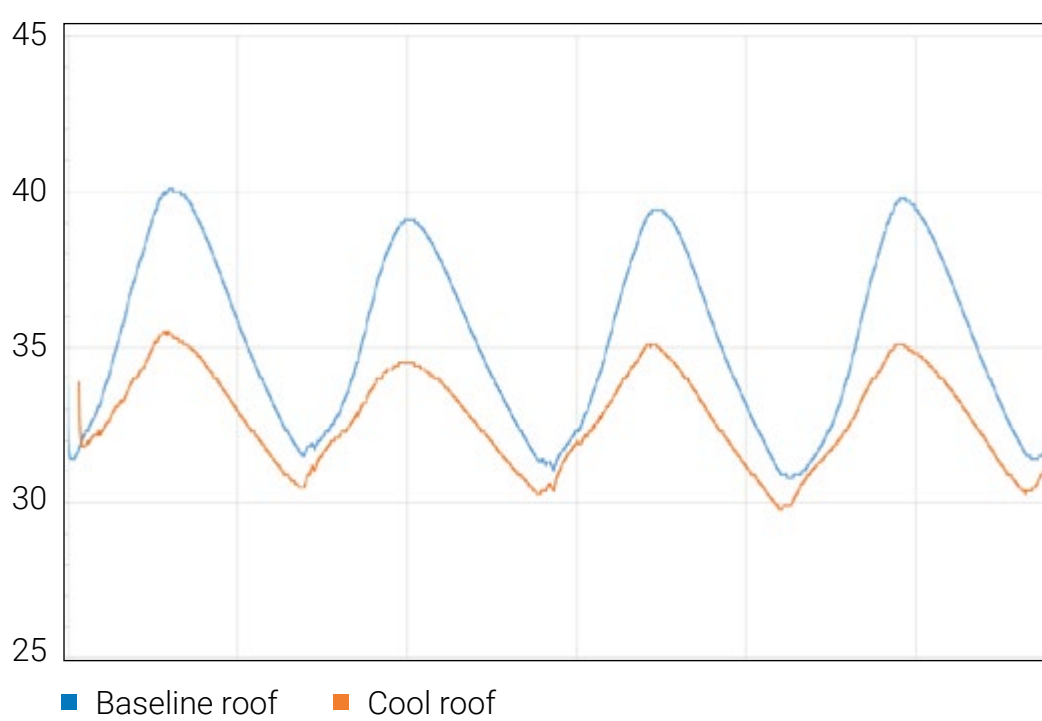


## Bedroom ceiling

*Internal surface at center of ceiling in bedroom*

### DIFFERENCE

**All:** -2.5 °C  
**During daytime:** -3.6 °C  
**During night:** -1.5 °C

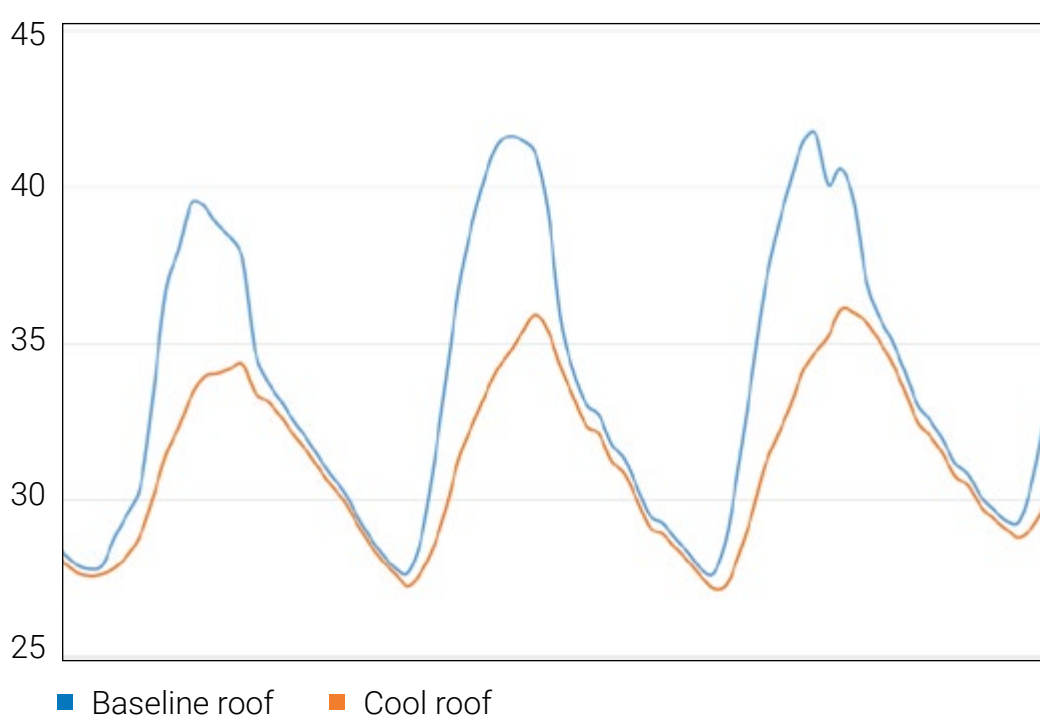


## Central ceiling

*Internal surface at geometric center of building*

### DIFFERENCE

**All:** -1.9 °C  
**During daytime:** -2.4 °C  
**During night:** -1.4 °C

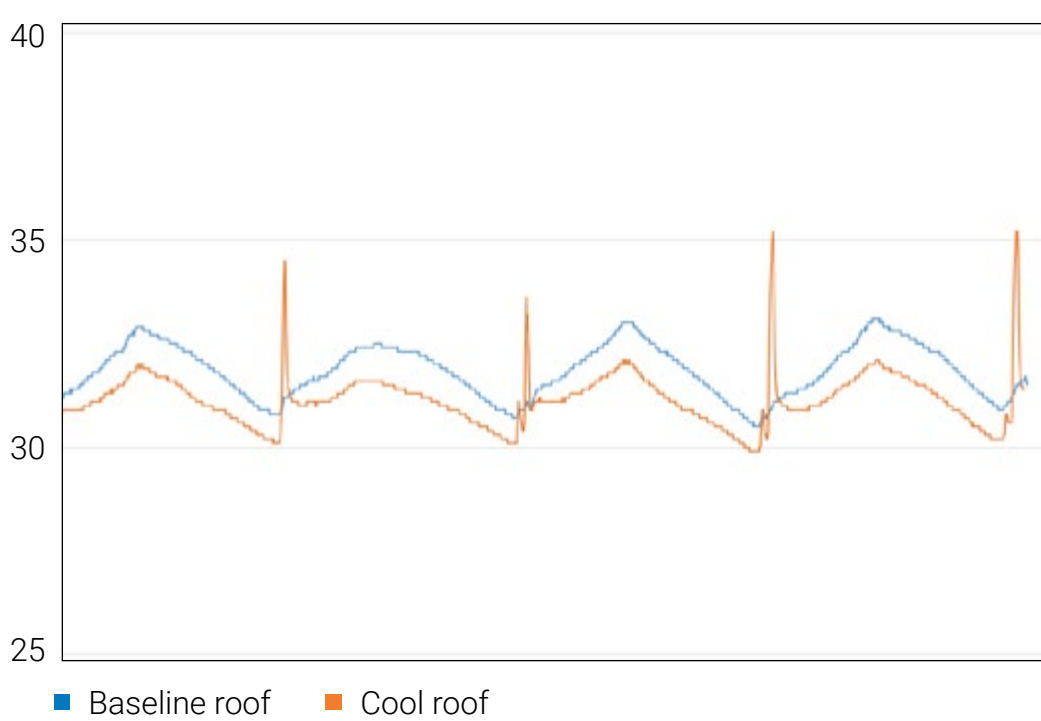


## Bedroom floor

*Internal surface at center of floor in bedroom*

### DIFFERENCE

**All:** -0.7 °C  
**Excluding peaks from direct sun:** -0.8 °C



\* Baseline roof painted with Comex Top (albedo = 0.3)