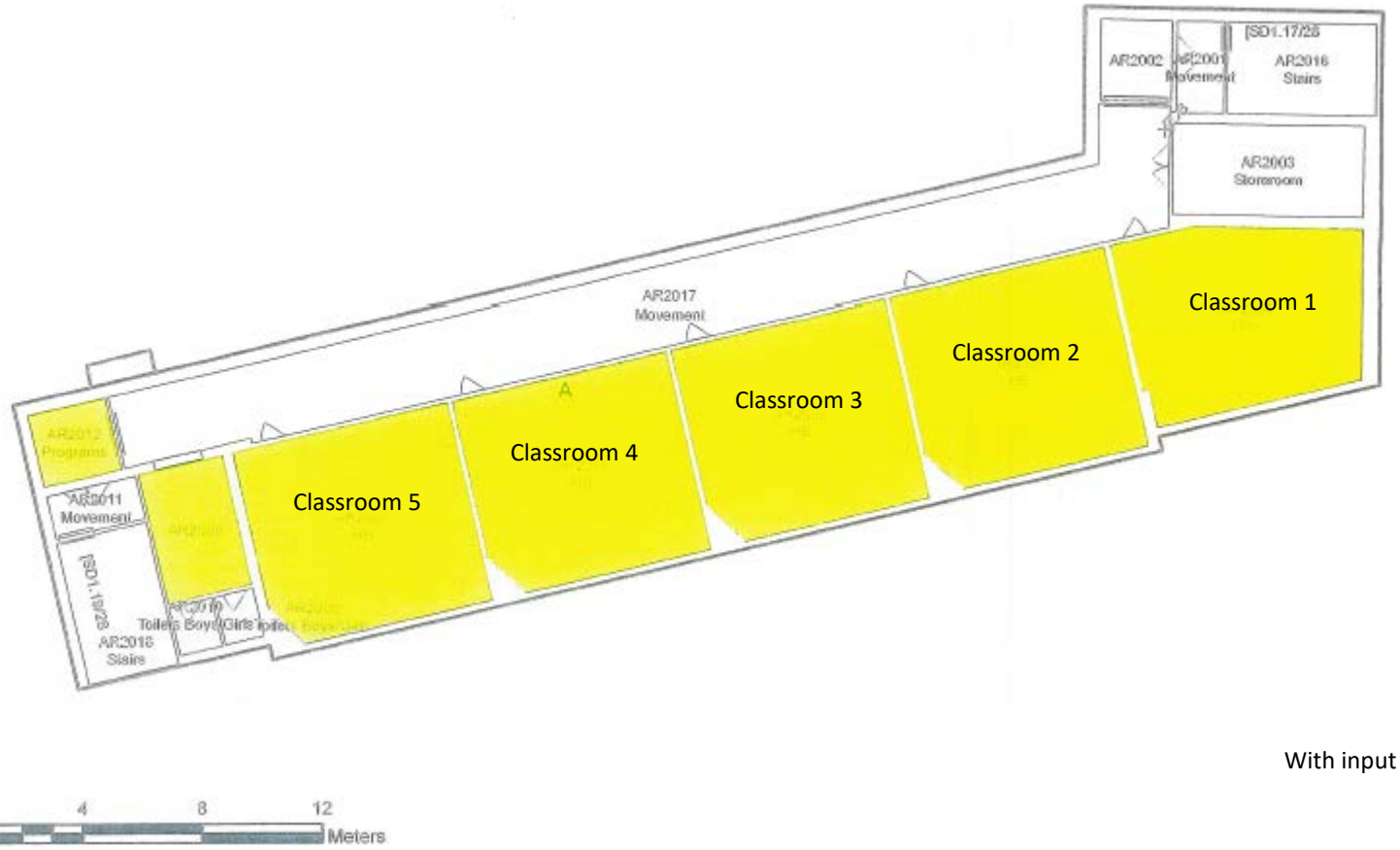
Project Cool School

Can the BPS top floor be any cooler?



With input from

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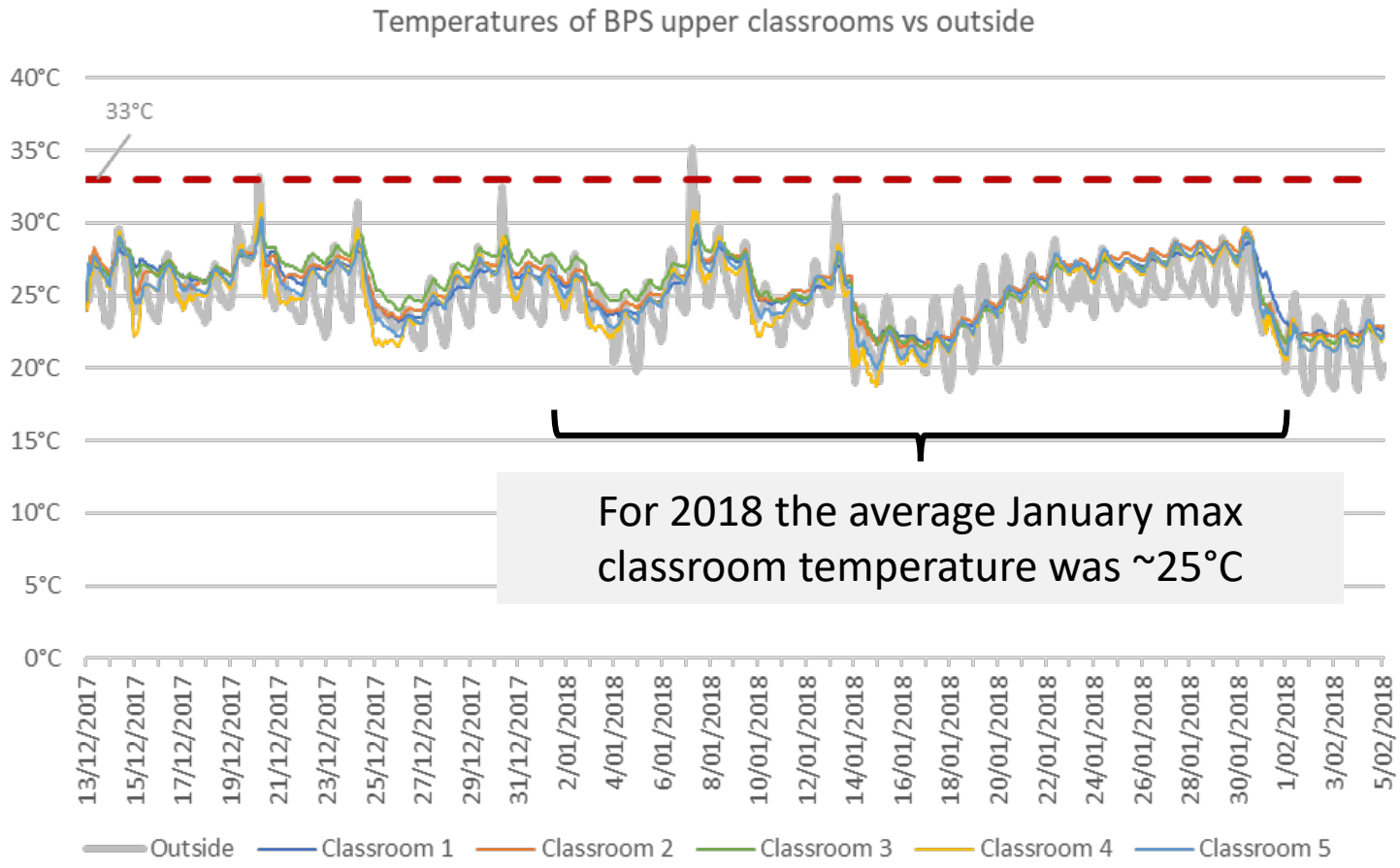
DoE Policy vs Measurement results

- Department of Education guidelines on air cooling (link)
  - Schools with average January max temperature of 33°C or more are provided with air cooling
  - Schools with average January max temperatures of 30-33°C may apply for air cooling funding



Cooling options

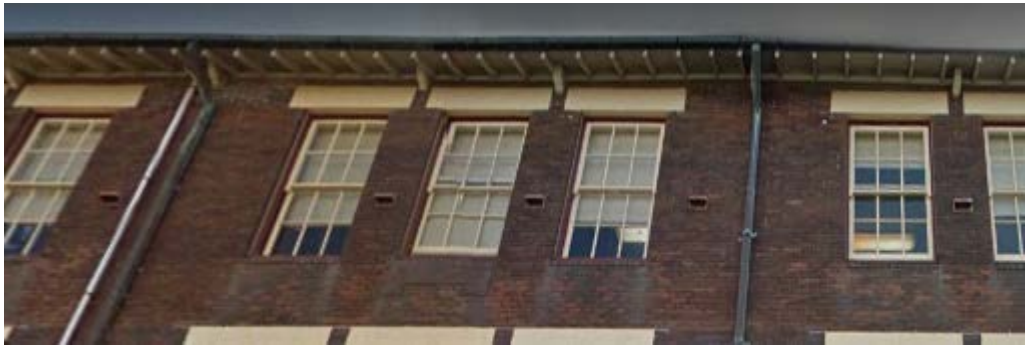
- Air conditioning and ducted exhaust: budget estimates

	Description	Cost excluding GST
1	Commercial grade ducted solution to each classroom (with a single outdoor condenser)	$160,000
2	Heavy domestic grade wall mounted split system to each classroom (with 5 x outdoor condensers)	$60,000
3	Commercial grade ducted exhaust system (**non conditioned**, therefore no external condensers)	$40,000

- These estimates are in line with media reports of other public schools facing $150k costs
- Option 2 appears most cost effective, but being domestic grade may suffer reliability issues and also face installation problems (5 outdoor condensers may challenge heritage approvals)
- Option 3 is considered capable of reducing temperatures by 2-3°C... to be confirmed by comparing classroom temperatures and the temperature of stairs/cooridors where the air would be drawn from
- There is plenty of room for ducting above the classrooms
  …as evidenced by all the old ducting that is left

Cooling options (cont.)

- Can do this now: Use the existing sash windows
  - **Open all windows at night** to purge classrooms of heat
  - **Close windows in the morning** to retain cool air
  - **Safety:** upper floor windows are already limited to open c.150mm
  - **Inoperable windows:** several windows are painted shut, could do with basic maintenance
  - **Cost for refurbishment of upper floor windows:** estimate $500 per window x 20 windows = $10,000
- Ceiling insulation
  - Insulates classrooms against heat from roof cavity in the summer, retains heat in winter
  - Estimate TBA but should pay itself off by reducing winter energy costs, also helps summer discomfort
- Venting the roof cavity with a solar powered exhaust (sample link)
  - Reinstates building's original design where hot air escaped through the roof tiles
  - Industrial models cost $3,000 plus installation cost (guess: $6,000?)
  - **Heritage considerations**: creates openings in the roof, but would be similar to previous roof



Potential next steps

1. Design Cool School Rules (strategies based on data)
   - Staff and P&C could designate a BPS Cool School Temperature (threshold comfort temperature)
     - Estimate frequency of uncomfortable days by correlating with long term Sydney Observatory data
     - For example: say BPS designates 30°C as the uncomfortable threshold, and we use data to show that 10 days every summer reach this temperature
   - Use data to create rules of thumb when to expect hot classrooms, and plan for them
     - For example: data says when outside temperatures exceed 30°C for the next three days, classrooms reach discomfort zone and we plan for outside classrooms
   - Continue temperature monitoring – to inform BPS P&C about winter conditions
2. Work to operate the existing sash windows
   - Experiment to see how much difference night purging can make
3. Follow through on equipment based solutions
   - Using BPS P&C feedback on budget, get firmer quotes for options such as
     - air conditioning/ducting
     - solar venting
     - sash window refurbishment
4. Solar roof?
   - Is there appetite to pursue a solar rooftop solution more broadly?
   - There are several companies willing to install solar rooftops, financed on a pay-as-you-use basis
   - May require engagement with NSW Govt (Dept of Education, Dept of Planning's NSW Renewable Energy Advocate)