Healthy Homes: Findings from the field and lessons from the lab

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What do we know about the condition and performance of our homes?

BRANZ House Condition Survey

- Every 5 years since 1994
- 400-600 houses
- Most recent 2015/16: nationwide, all tenures
- Shows disparity between owned and rented
- Results helped inform development of HHS

MOULD

was visible in **49%** of all houses

44% owned > **56%** rented

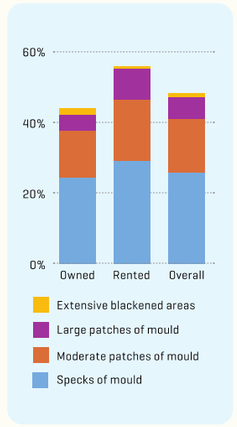
Mould was most commonly found in bathrooms.

mould in bedrooms

almost **30%** of rentals > **18%** owner-occupied

Managing mould

Mould was more commonly observed in houses lacking **effective heating, ventilation and insulation**



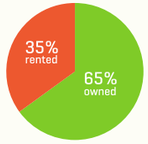
VENTILATION

Only around **HALF** had an extractor fan **in the bathroom** venting to outside

Only around **HALF** had an extractor fan **in the kitchen** extracting to outside

560 NZ HOUSES

assessed from September 2015 to June 2016



INSULATION

53% could benefit from retrofitted insulation in the roof space and/or subfloor

47% had less than 120mm or insufficient coverage of insulation in the roof space

19% had insufficient coverage of insulation in the subfloor

HEATING APPLIANCES

Heat pumps
40% of owner-occupied houses > **25%** of rentals

Wood burners
39% of owner-occupied houses > **23%** of rentals

Electric heaters
25% of owner-occupied houses < **33%** of rentals

Portable unflued gas heaters
4% of owner-occupied houses < **15%** of rentals

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Responding to changing needs for housing data

Measuring housing quality

- No official statistic measuring housing quality in Aotearoa New Zealand
- Definition and conceptual framework developed (June 2019) - key step towards housing quality statistic: https://www.stats.govt.nz/methods/framework-for-housing-quality

Addressing the data gap

- Stats NZ: General Social Survey 2018
- Plus 'objective' data

Pilot Housing Survey 2018/19

- New data collection tools and approaches

Stats NZ Tatauranga Aotearoa

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

MINISTRY OF HOUSING AND URBAN DEVELOPMENT

Land Information New Zealand
Toitū te whenua

DATACOM

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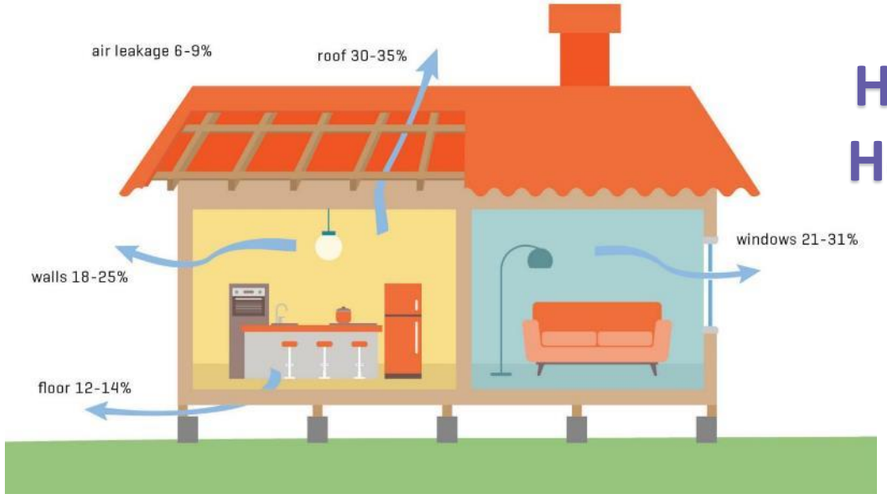
Pilot Housing Survey Content

What is needed for warm, dry, healthy homes?



Housing Quality Measure
Healthy Homes Standards

Minimising heat loss

Heating

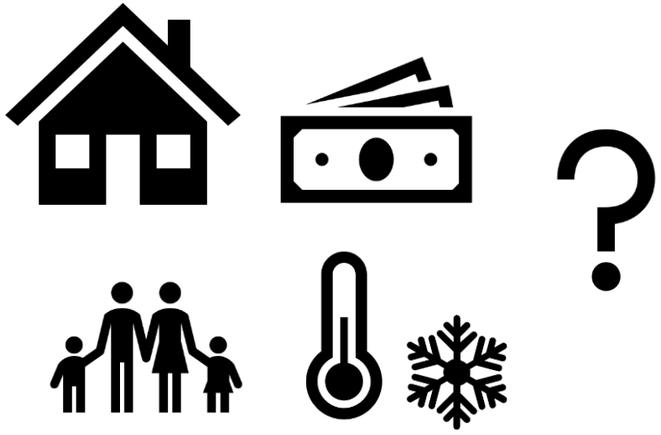
Moisture control & Ventilation

Topic	PHS data
Basic amenities	Bathing and toilet
	Food prep and cooking
	Potable and hot water
Health and safety	Slips, trips, falls
	Wiring
	Security
	Lighting
	Damp and mould
Keeping moisture out	Weathertight envelope
	Gutters and downpipes
	Ground vapour barrier
	Subfloor vents and ponding
Managing moisture	Mechanical extract ventilation
	Openable windows
Keeping the heat in	Insulation
	Glazing
	Curtains ★
	Draughts and gaps ★
Heating	Type and location

Survey outcomes

- **Stats NZ General Social Survey** (~**8000**):
  - Socio-demographic data
  - Indicators of wellbeing
  - Occupant perception of house condition
  - Maintenance and repair
  - Healthy housing habits – heating, ventilating
  - Self-reported problems with damp and mould
  - Self-reported indicators of energy hardship
- **BRANZ PHS (~800, Aug 2018 – June 2019)**
  - Largest national housing assessment survey since 1930s
  - All recruited through the GSS
  - All tenures and house types
  - Nationwide coverage
  - **~80** of these **monitored** (temp, humidity) over 12 months

New opportunity to explore household characteristics, wellbeing and self-reported housing indicators with independent housing assessment data



Results: General Social Survey

Dwelling suitability

Rented | Owned

31.8 | 50.9
Very suitable

50.9 | 41.8
Suitable

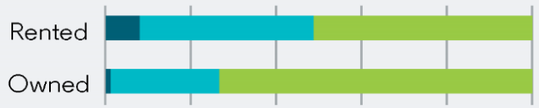
10.2 | 4.6
Neither suitable or unsuitable

7.1 | 2.7
Unsuitable /very unsuitable

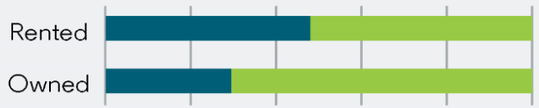
Renters rate their dwelling suitability lower

Feeling the chill

Damp:
always / sometimes / not damp



Mould:
has mould / doesn't have mould



Households in rented accommodation are more likely to live with damp, cold and mould than those living in their own home.

Can you see your breath inside?

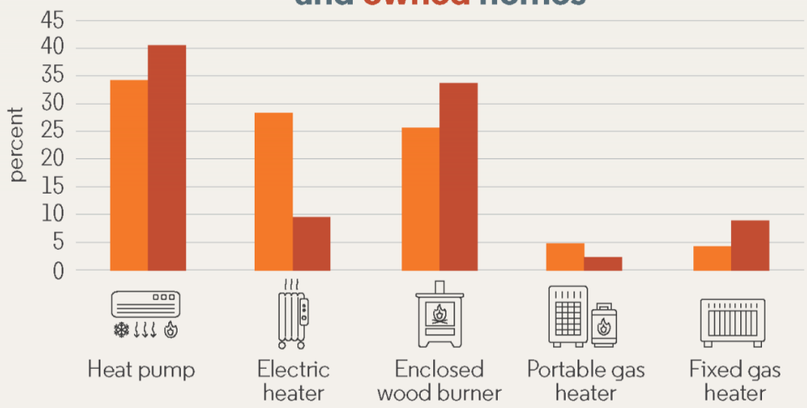
32% of renters and
13% of owners can

Heating our homes

Electric heaters and portable gas heaters are more common for renters while woodburners are more common for owners.

Rented Owned

Heating appliances in rented and owned homes



Stats NZ
Tatauranga Aotearoa

https://www.stats.govt.nz/infographics/renting-vs-owning-in-nz

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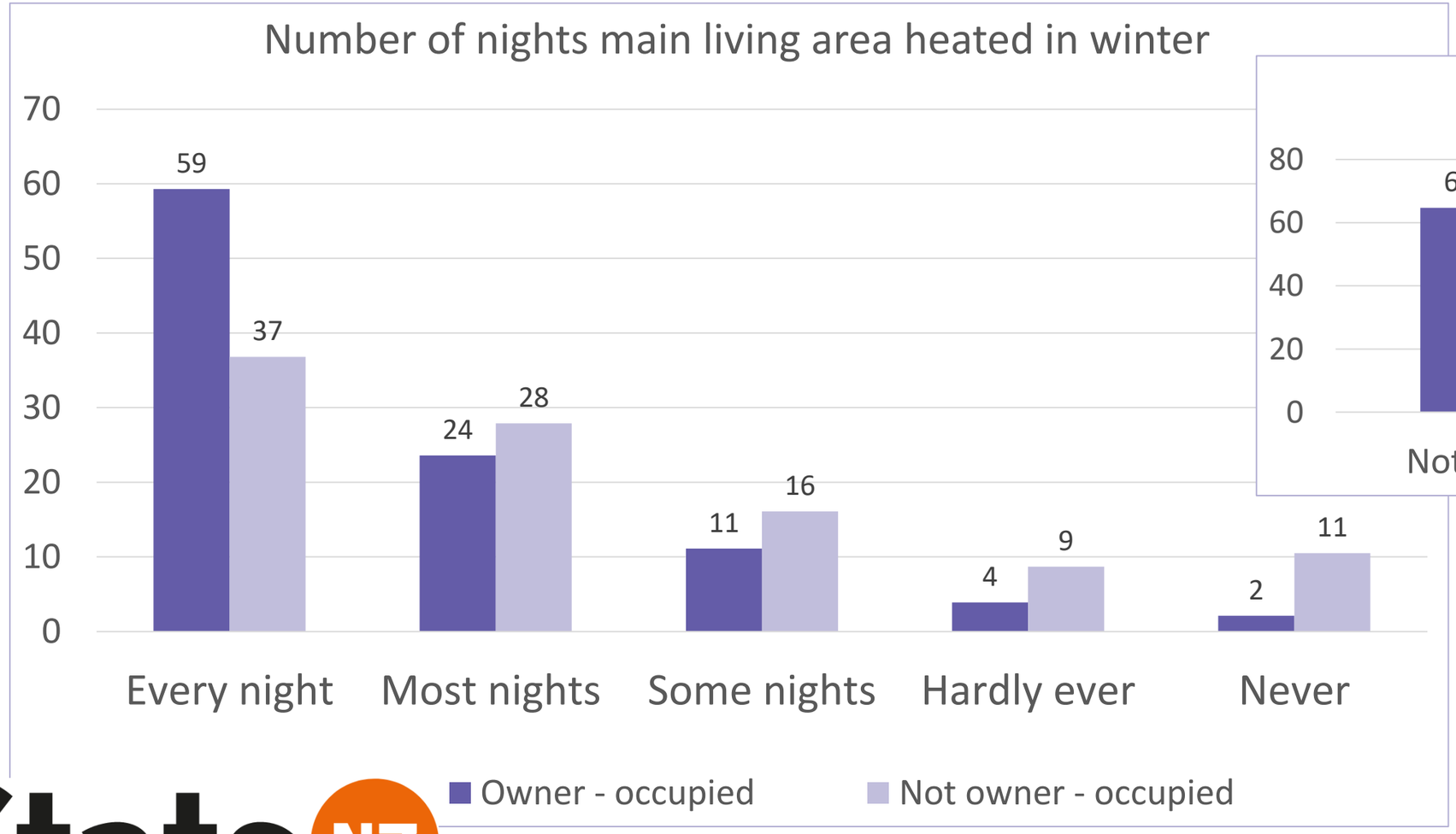

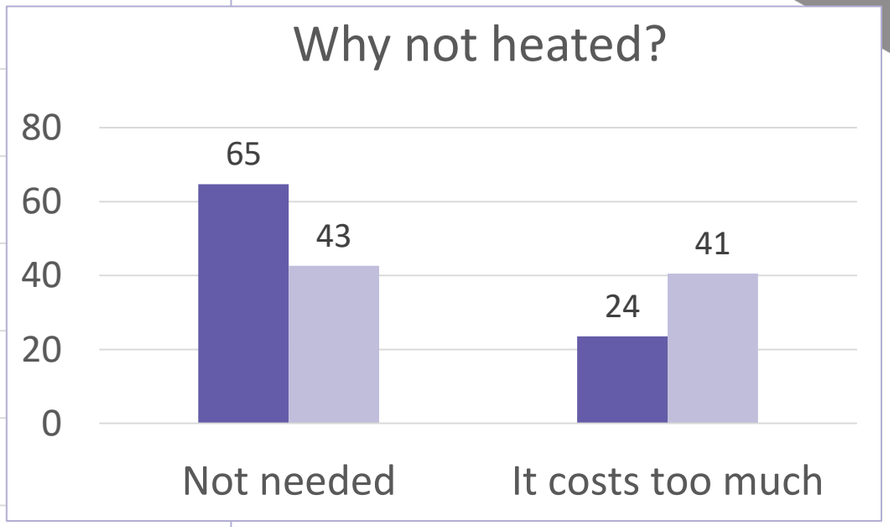

Stats NZ
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Healthy Homes Standards – What might the data tell us?

HHS topic	Pilot Housing Survey data
Underfloor and ceiling insulation	Accessibility, type, coverage, depth (ceiling)
Heating (main living area)	Type, room size, open plan
Draughts	Extent and size of gaps
Drainage	Ponding, ground vapour barrier, guttering defects, subfloor ventilation
Moisture ingress	Roof, wall and window defects, signs in roof space
Ventilation	Presence, working, extracting to outside; ducting issues

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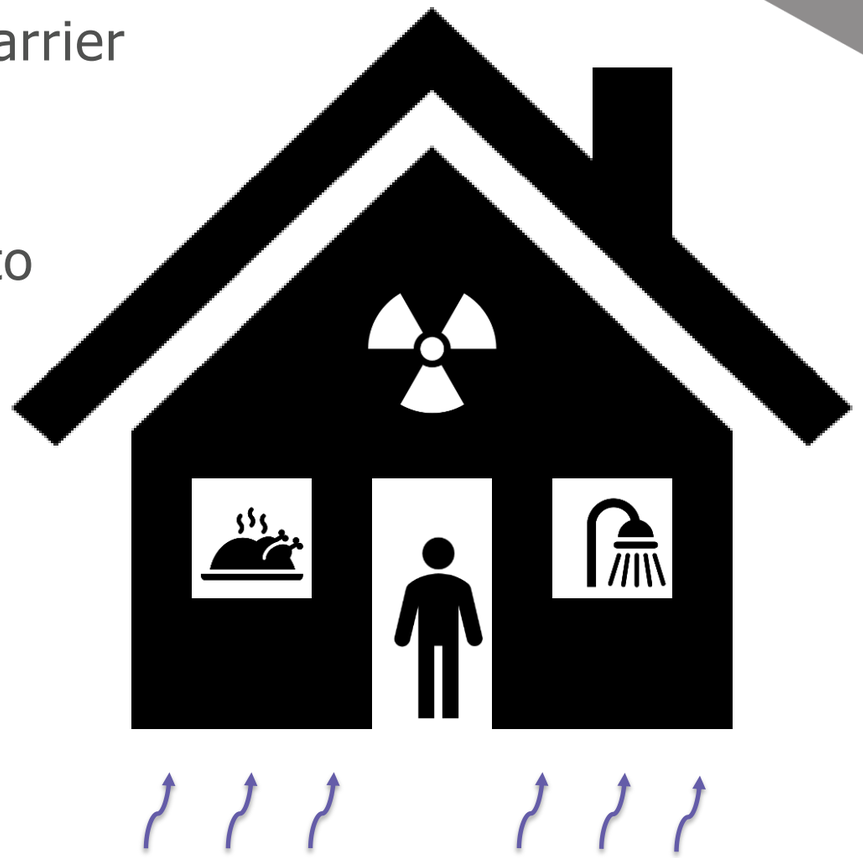
Results: PHS (and HCS)

- Data still being processed…but (consistent with HCS)…
  - ~ Less than one fifth with adequate ground vapour barrier
  - ~ One fifth with insufficient subfloor insulation
  - ~ Half of rentals without mechanical extract venting to outside (bathrooms and kitchens)
  - ~ Mould more likely to be observed where extract ventilation lacking
- Moisture going in, houses becoming more airtight
  - ⇨ Controlled ventilation even more important



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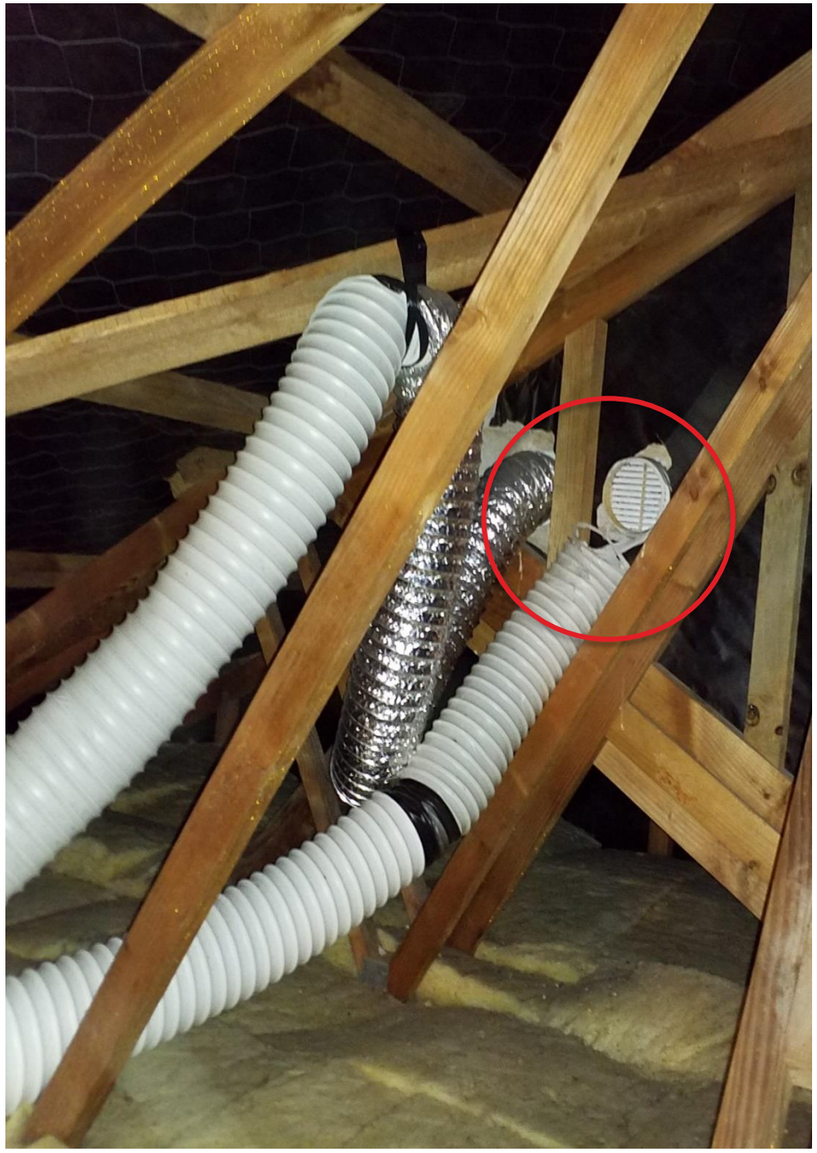
Findings from the field & Lessons from the lab

Extract errors, fan faux-pas and ducting don'ts

1. Be sure to connect

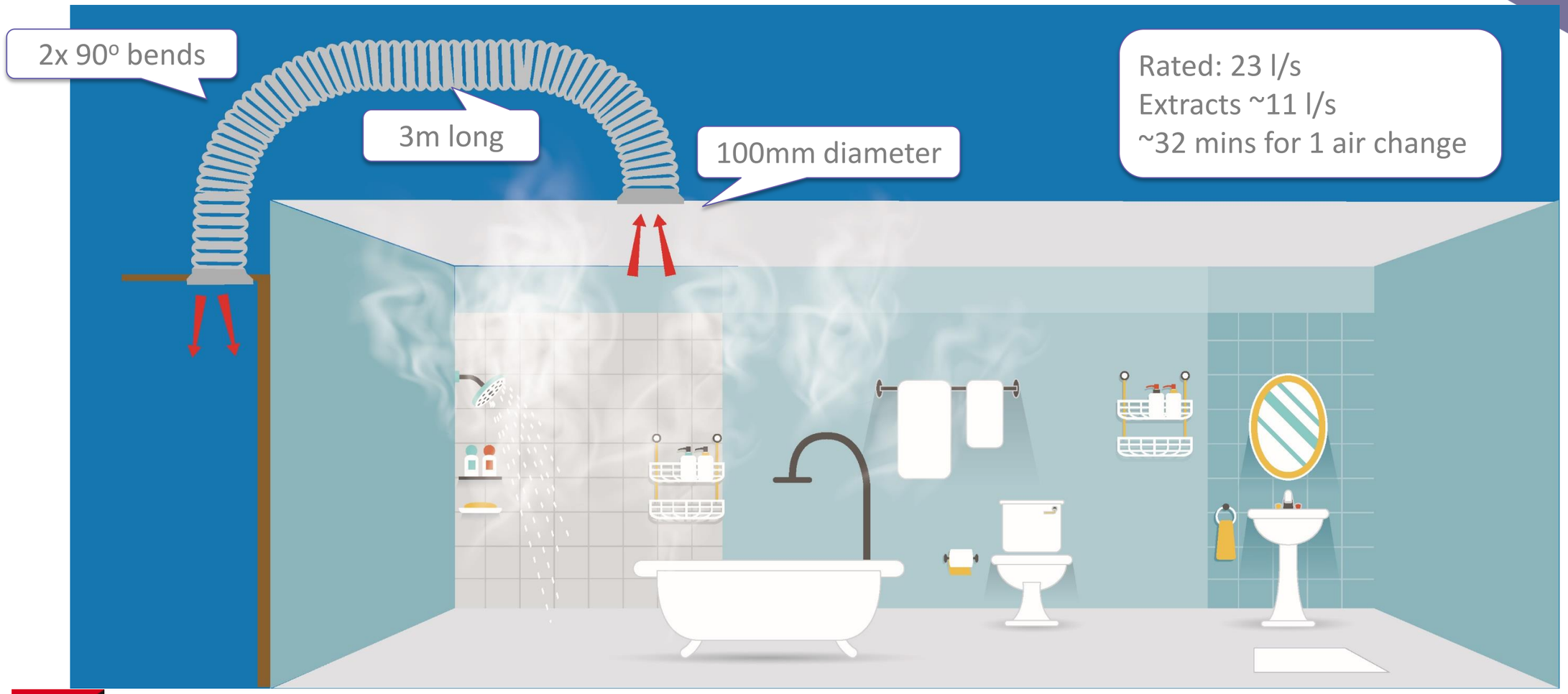
2. And stay connected



3. Think about sizing and positioning

4. Creative ≠ Effective

Some physics...



3m x 3m x 2.4m bathroom

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Some physics…

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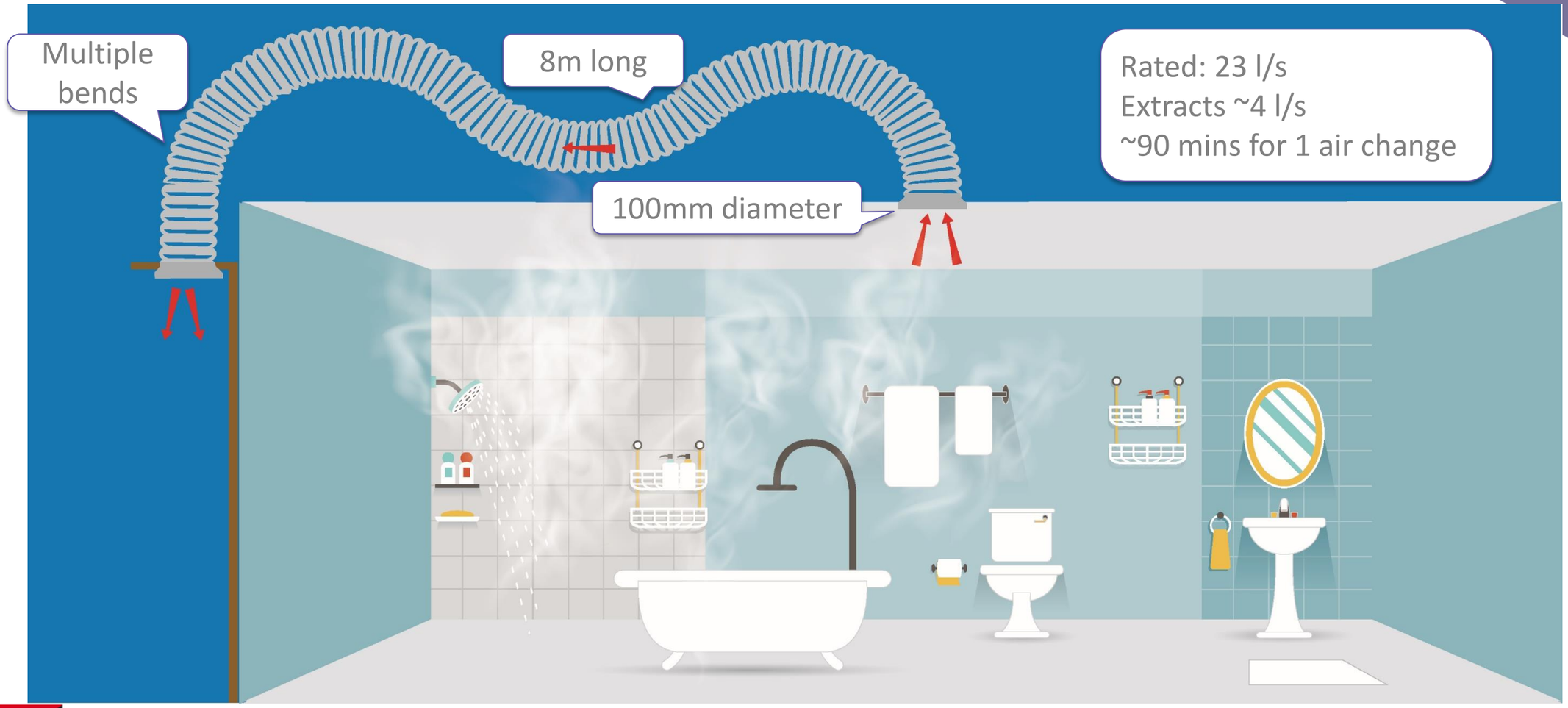

3m x 3m x 2.4m bathroom

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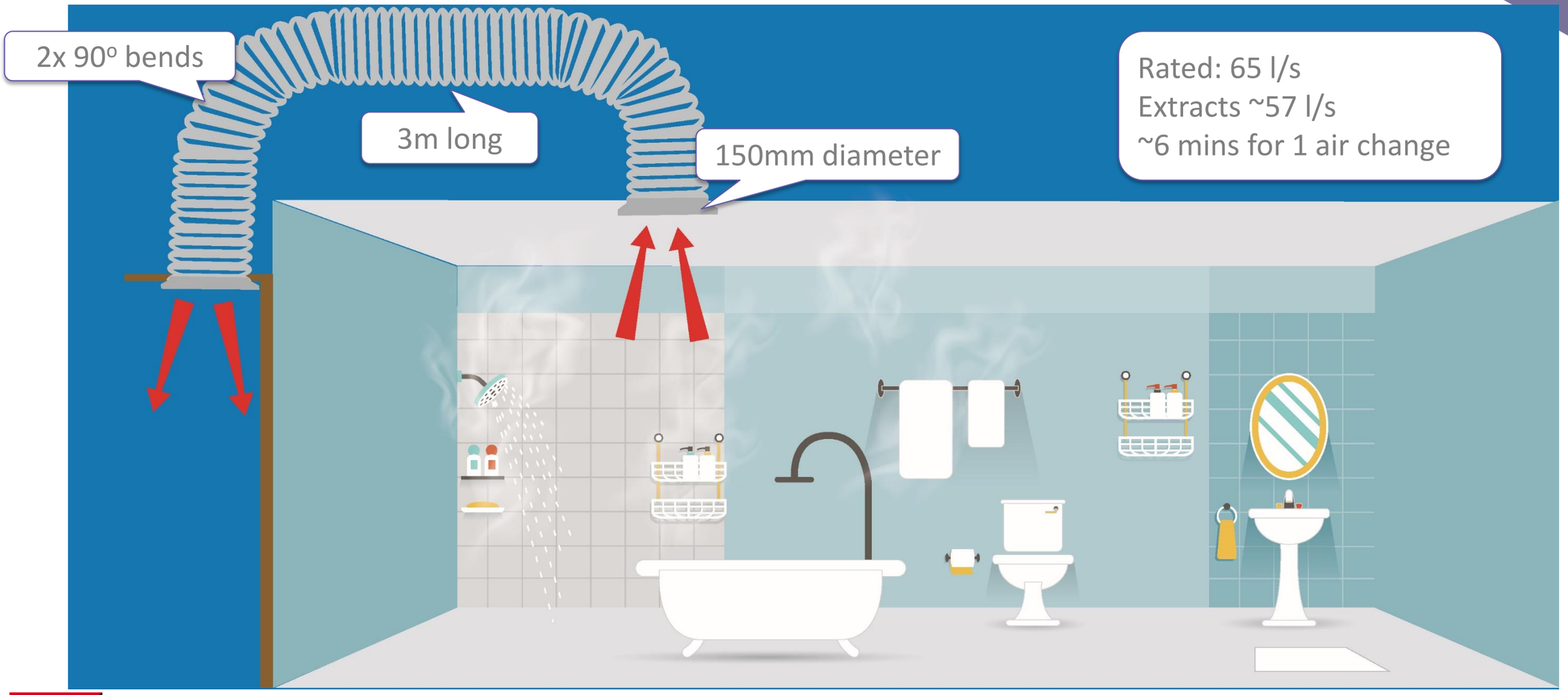

3m x 3m x 2.4m bathroom

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5. An extract in disguise

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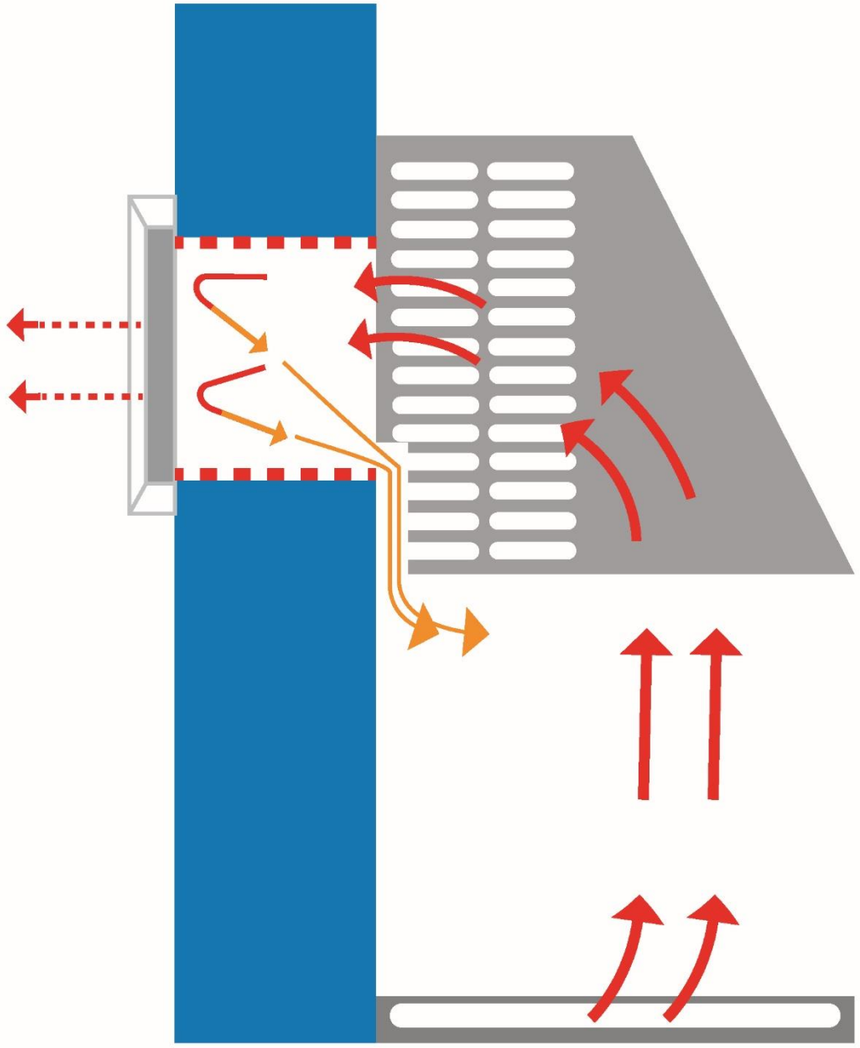
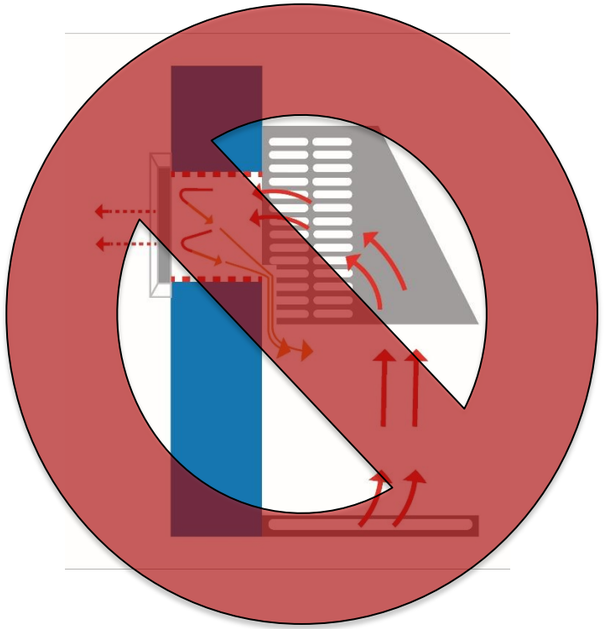


Why does it matter?

- Inadequate ventilation effects building and occupants
- Healthy Homes Standards set new requirements for extract ventilation in rentals

Fan + ducting must:

- Kitchens (new installs post-July 2019)
  - Diameter at least 150mm; OR
  - Exhaust capacity of at least 50 litres per second
- Bathrooms: (new installs post-July 2019)
  - Diameter at least 120mm; OR
  - Exhaust capacity of at least 25 litres per second



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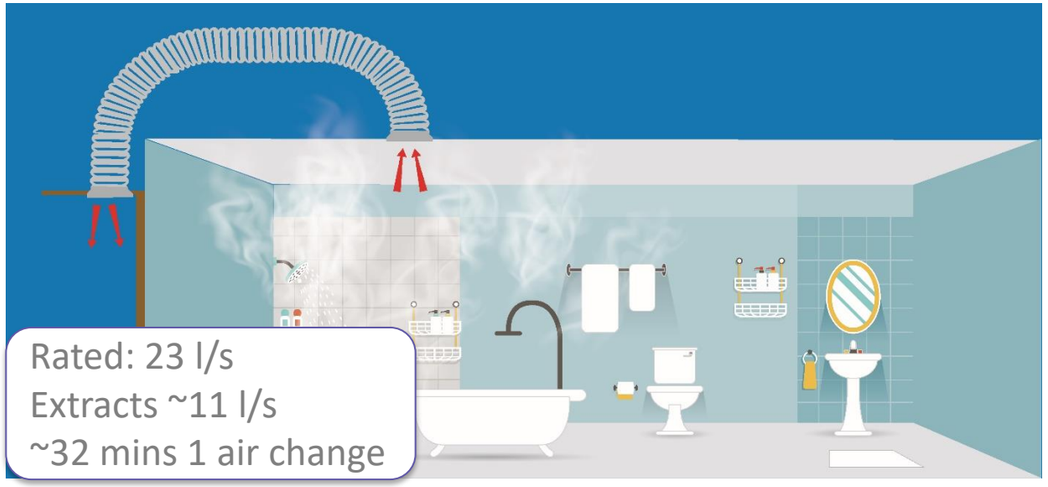
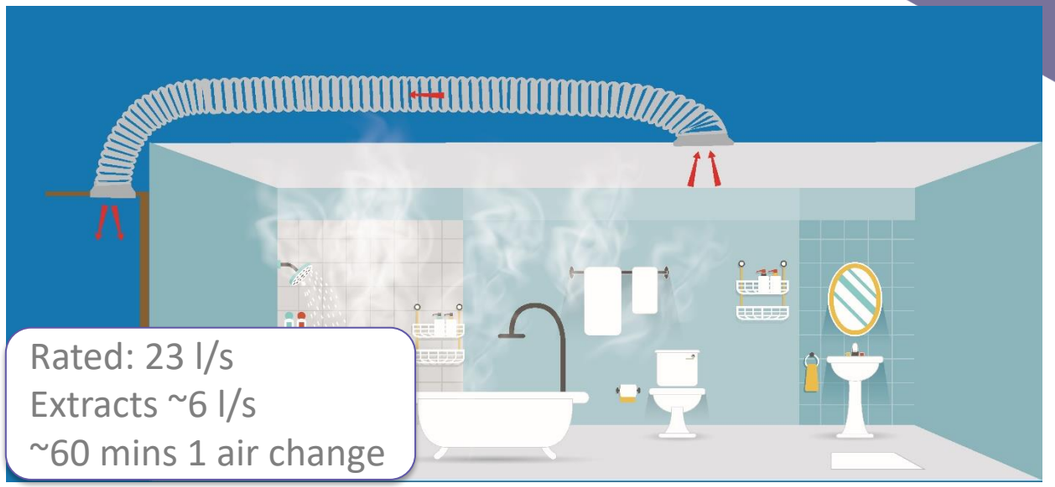
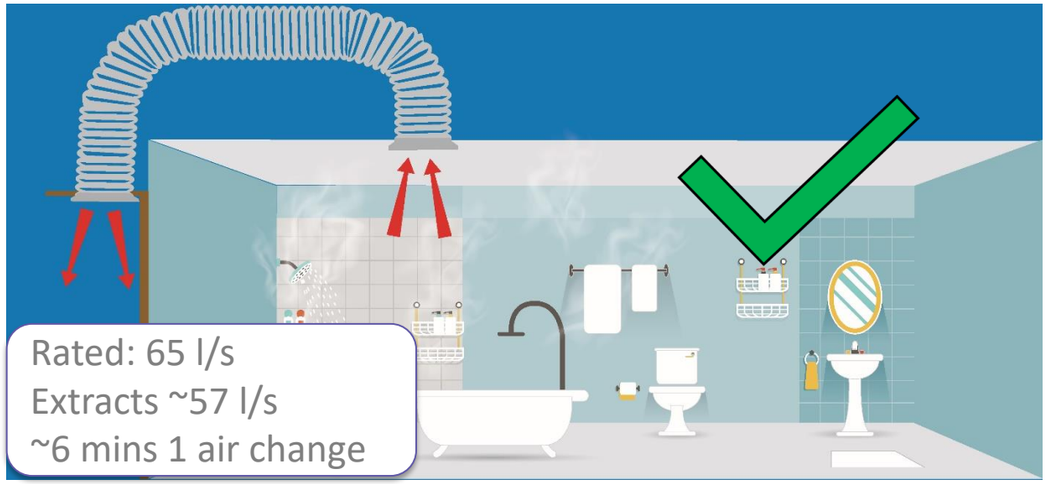
Meeting the HHS







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Summary

Considerations:

- **Ducting**:
  - Length
  - Material
  - Rigidity
  - Install
- **Fan size**

Impact performance and effectiveness

Best practice advice:

- Check existing devices
- Maximise duct and fan size
- Consider location of intakes/exhaust
- Minimise run lengths
- Minimise bends
- Rigid or taut flexible
- Tape and seal joints well

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Science Talk: Extract Ventilation – Working Calculations
https://youtu.be/A_fi08DhqZM