(TRANSIENT) NOISE OF HEAT PUMPS

IEA HPT TCP – Annex 51 – Task 4 (and partially Task 3)
Acoustic Signatures of heat pumps

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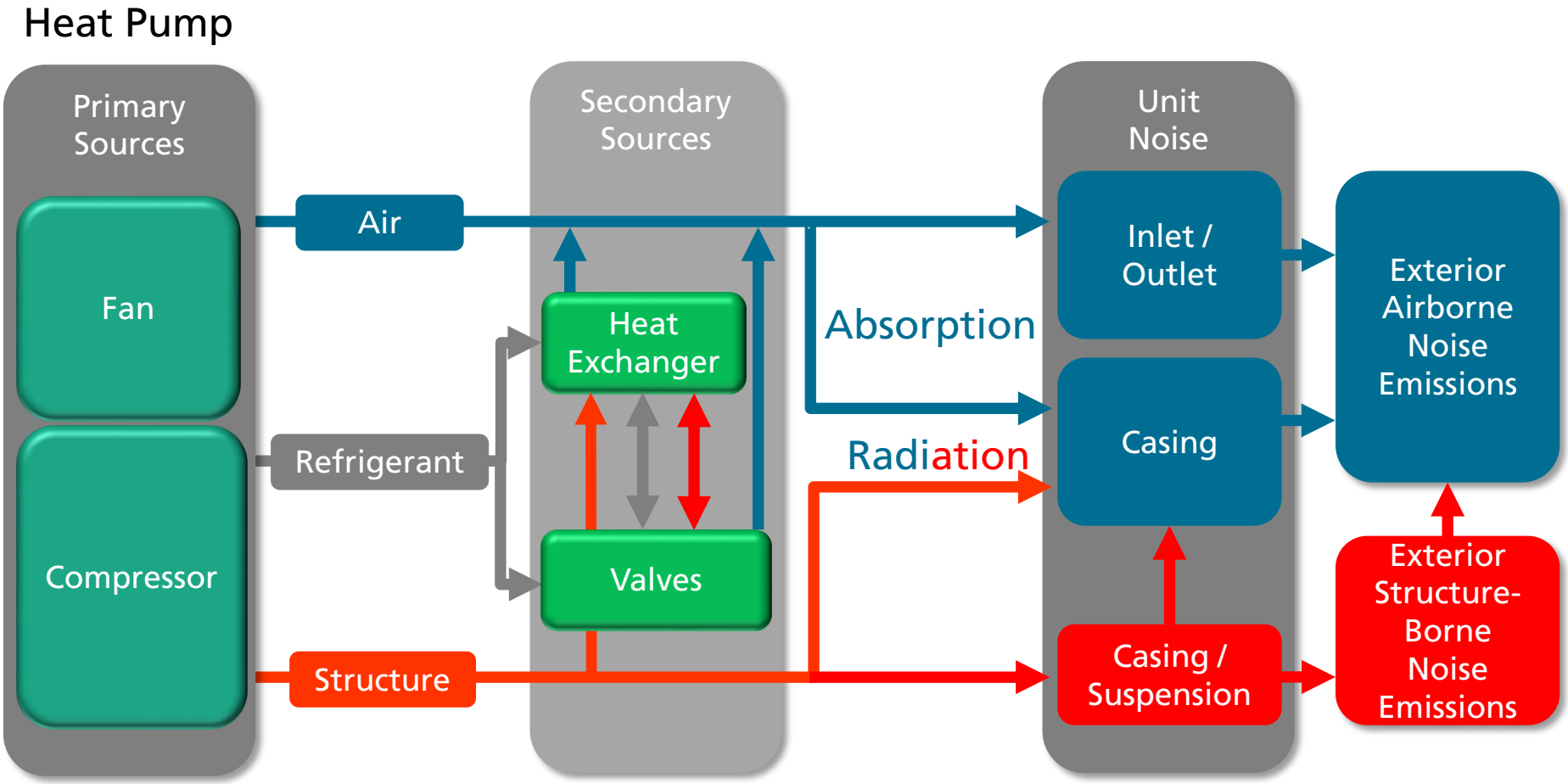
Annex 51 Webinar

30.11.2020

Link of the reports:
https://heatpumpingtechnologies.org/annex51

Acoustics in Heat Pumps

Interdependency of air and structure-borne noise

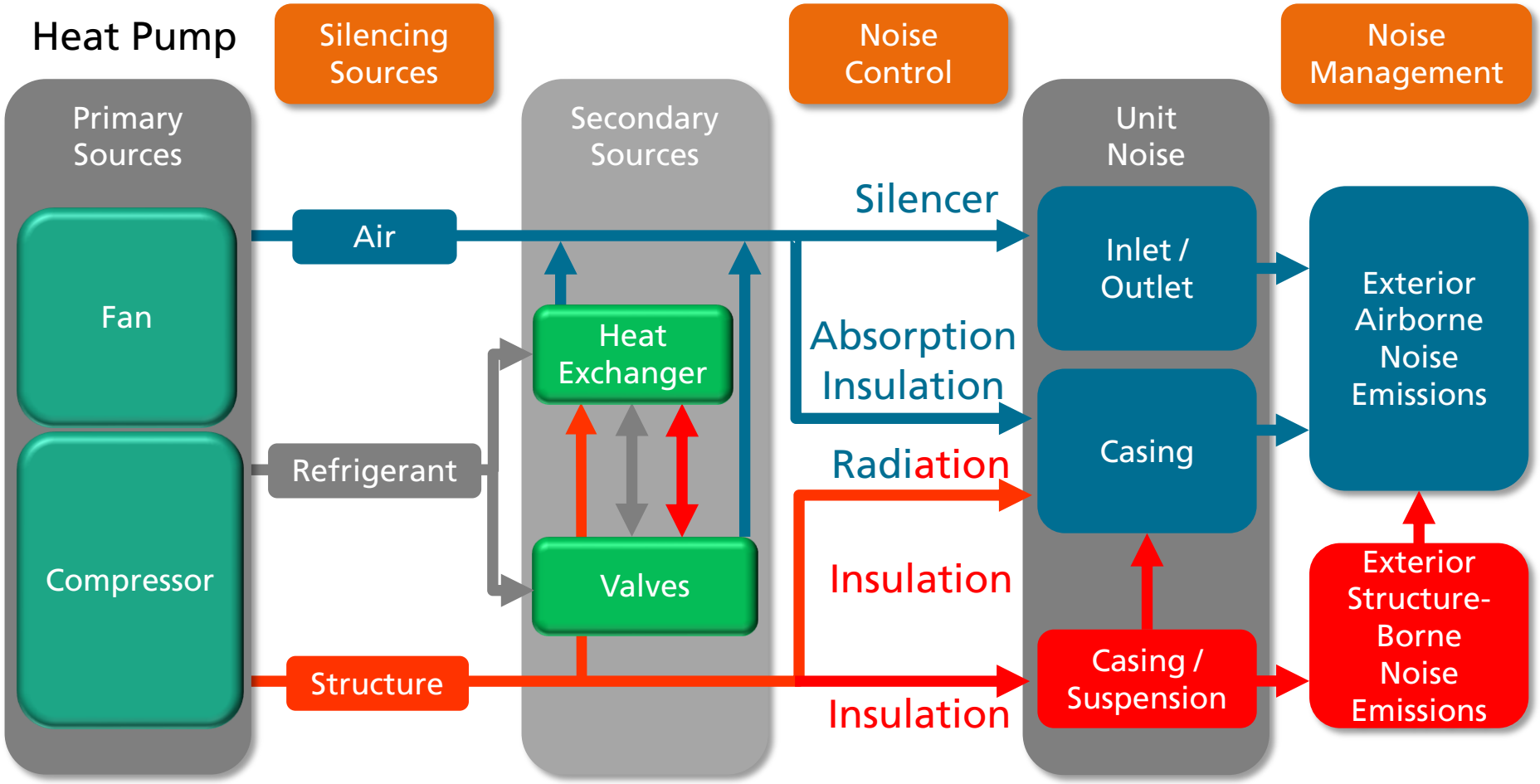


Acoustic contributions from hydronic circuits not shown here.

Source: Developed by Fraunhofer IBP

Acoustics in Heat Pumps

Noise of components and noise control – Task 3 activities

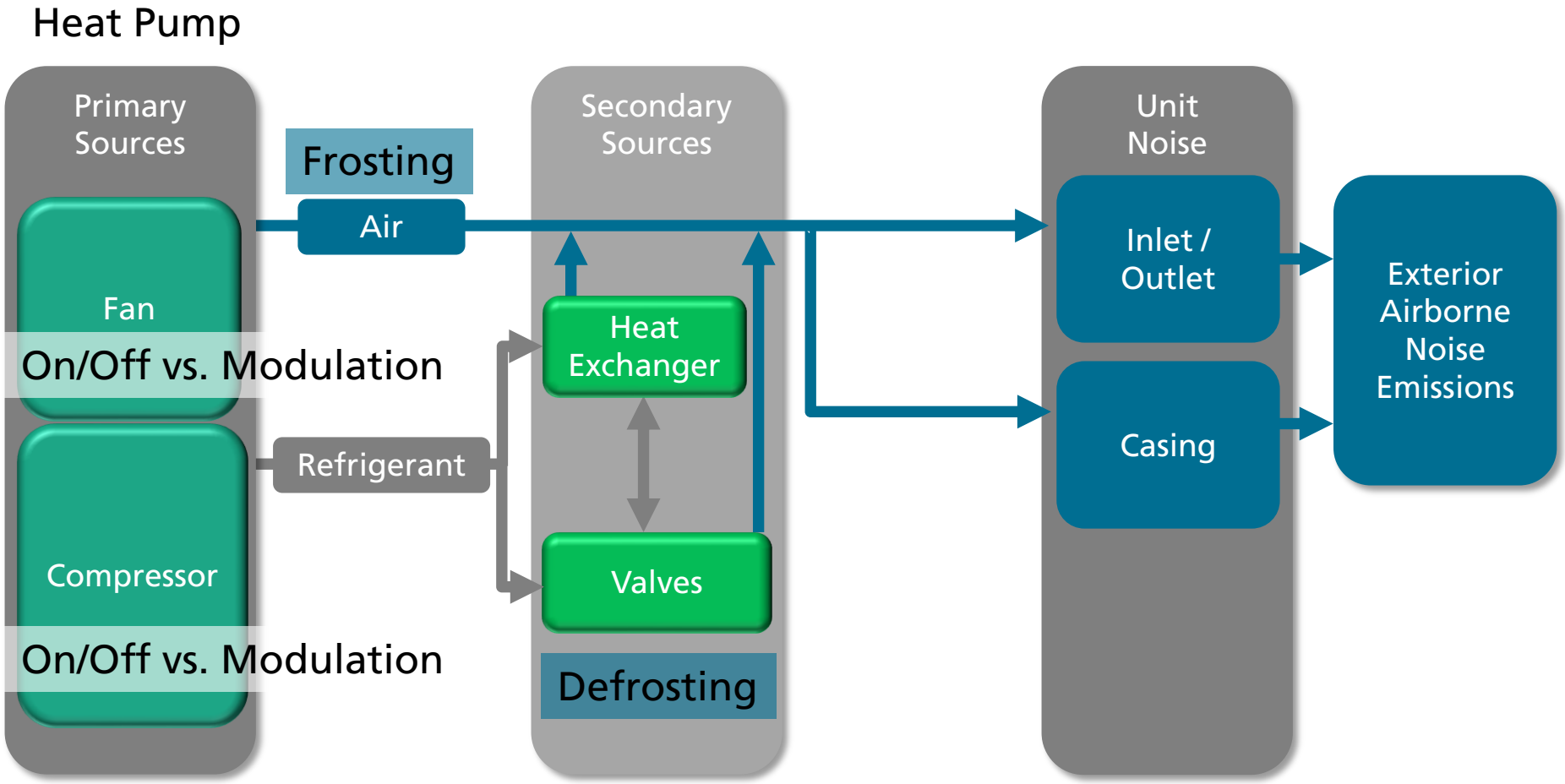


Acoustic contributions from hydronic circuits not shown here.

Source: Developed by Fraunhofer IBP

Acoustics in Heat Pumps

Transient noise effects in operated HPs – Task 4 activities



Acoustic contributions like DHW tapping not shown here.

Source: Developed by Fraunhofer IBP

Acoustics in Heat Pumps

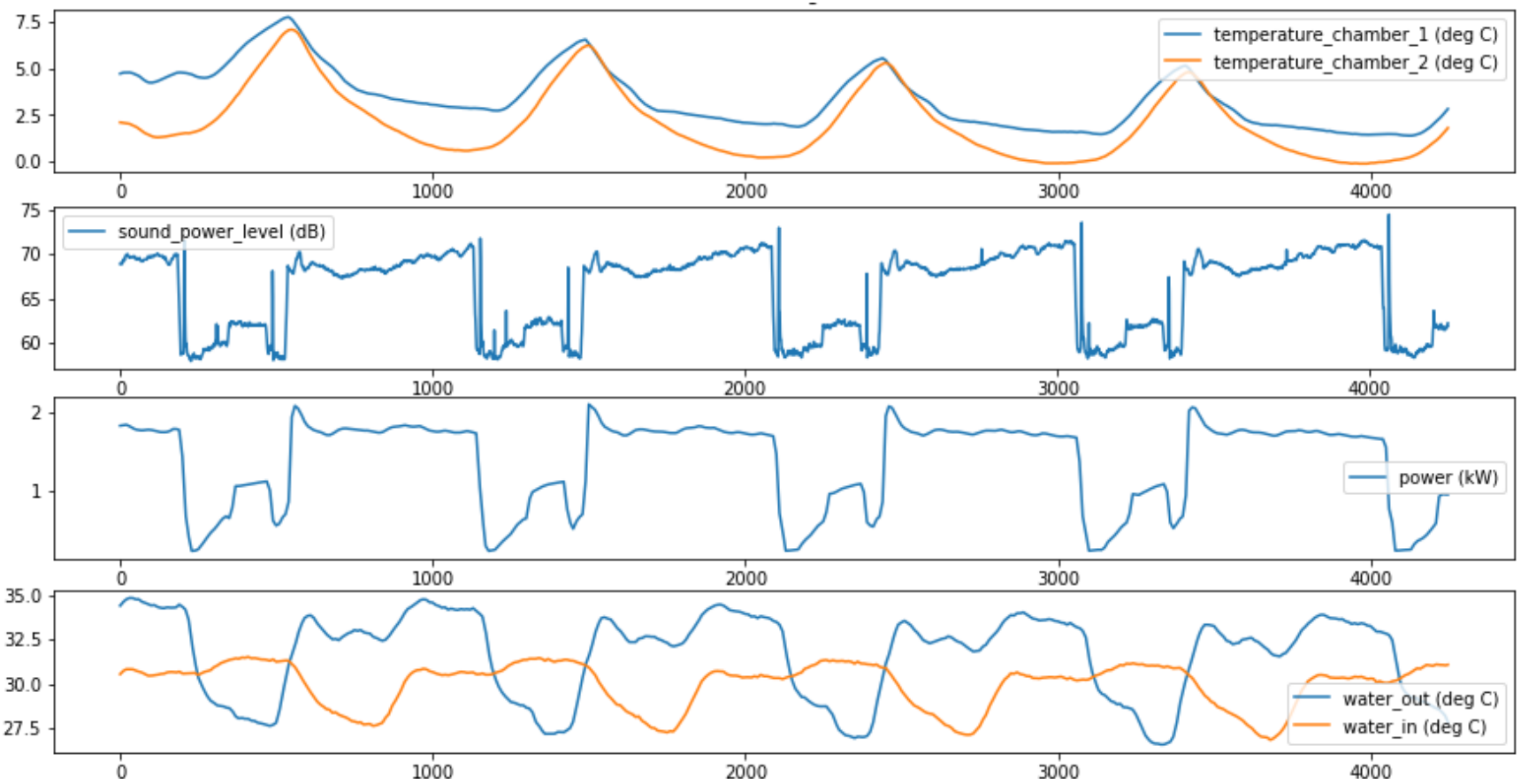
Transient noise effects in operated HPs – Task 4 activities

Dynamic processes	Time scale	Frequency	Acoustic impact	Involved excitators
	[h]	[day^{-1}]	[Large/Small]	
Frost growth	0.5 < x < 8	1-7	Large	evaporator, fan, compressor
Defrosting	< 0.2	1-7	Large	compressor, 4-way valve
Superheat control	< 0.01	Permanent	Small	eev
Compressor frequency modulation	0.2 < x < 0.01	Permanent	Large	compressor
Hydronic pumps	> 0.1	Permanent	Small	hydronic pump
Hydronic valves	> 0.1	Permanent	Small	hydronic valves
Air flow / Fan frequency	0.1 < x < 0.01	Permanent	Large	fan

- nature and intensity of emitted noises strongly depend on the operating conditions → see preliminary presentation + task 2 + task 4 report
- Most prominent: emissions during frosting/defrosting
  - switching to reverse flow counts for hissing noises
  - frost growth

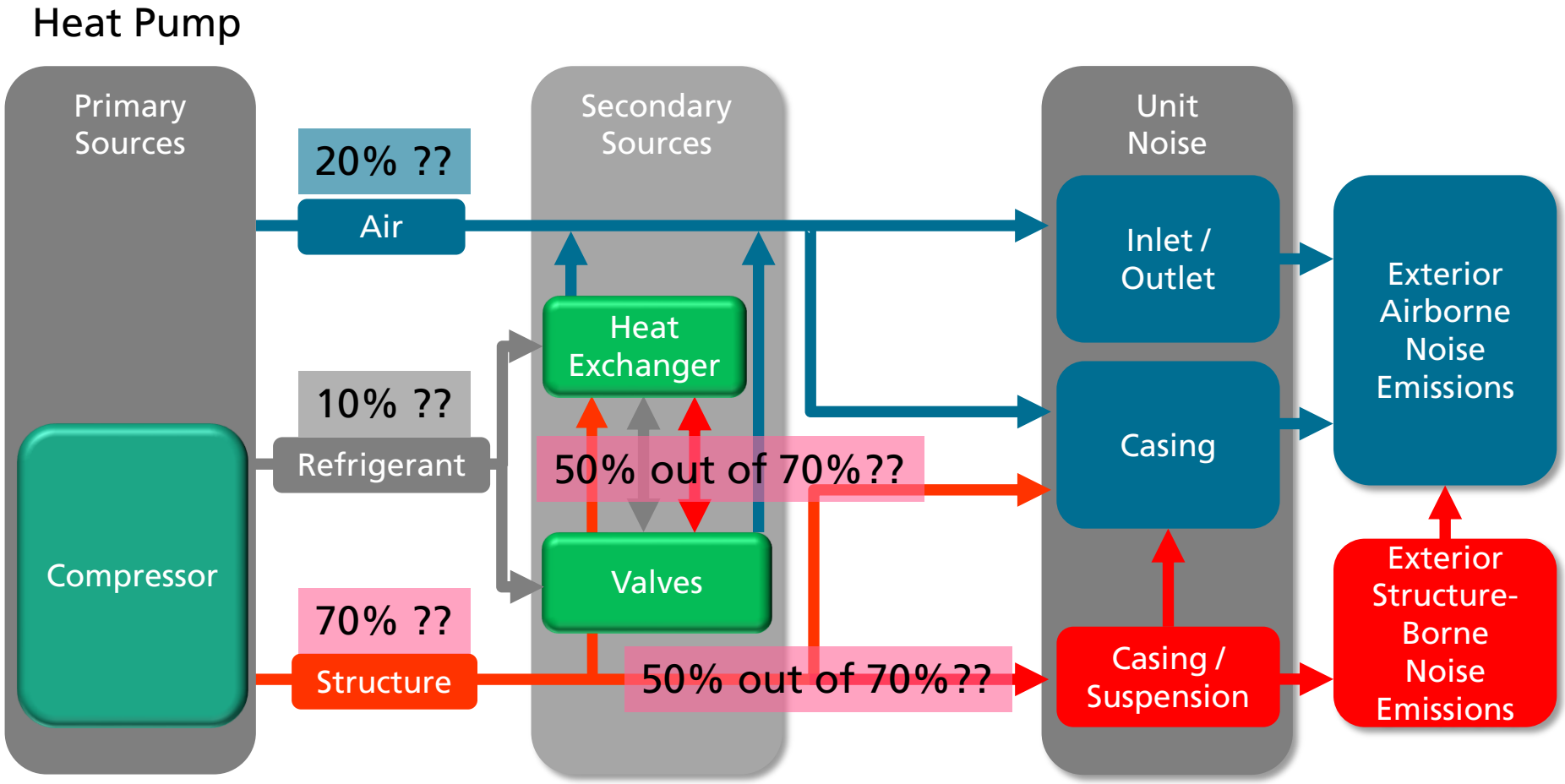
Acoustics in Heat Pumps

Frosting / Defrosting



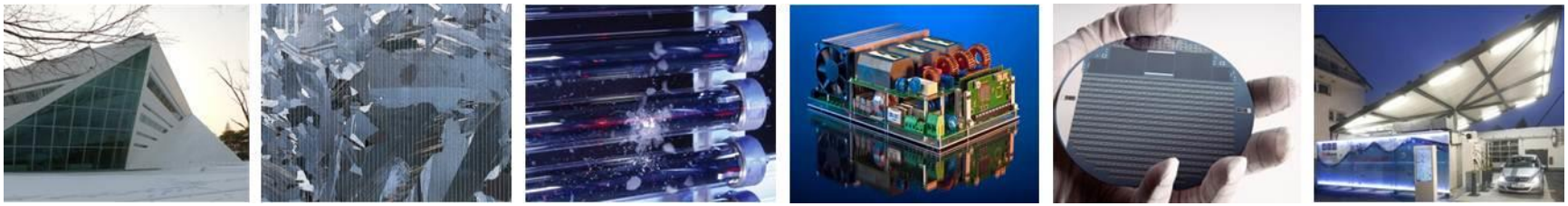
Source: AIT

Acoustics in Heat Pumps – Unclarified issues:
What is the share of noise types by a compressor?



Source: Developed by Fraunhofer IBP

Thank you for your attention!



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Please find all reports here: https://heatpumpingtechnologies.org/annex51