The truth about heat pumps, *Peter Mason, Summer 2023*

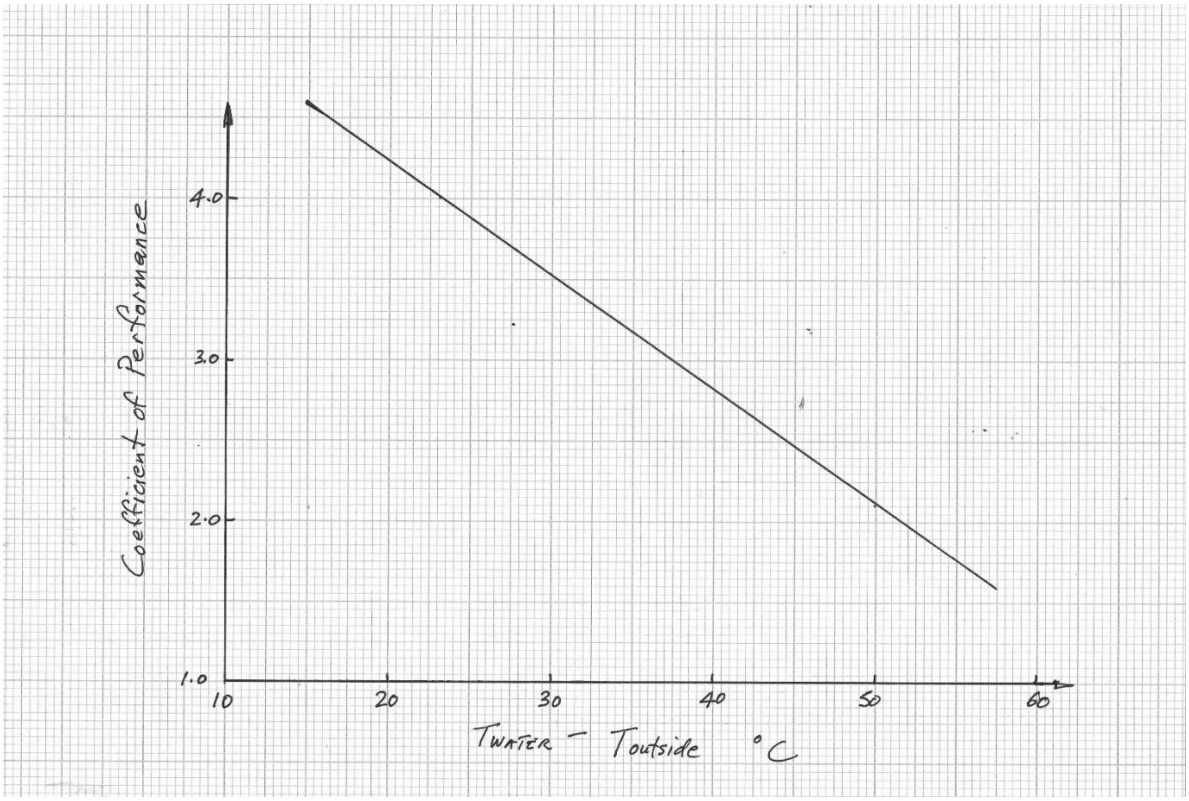
What is a heat pump?

- A complex engineering device
- An established and reliable technology (in fridges, air-con, car heaters…)
- Pumps heat from cooler to hotter places – plenty of heat energy in the cool environments of air, water, ground
- Not just a simple energy converter, e g, electric fire, gas boiler
- Needs some power to make it work
- The efficiency is huge, typically 300%, expressed as a Coefficient of Performance (CoP).

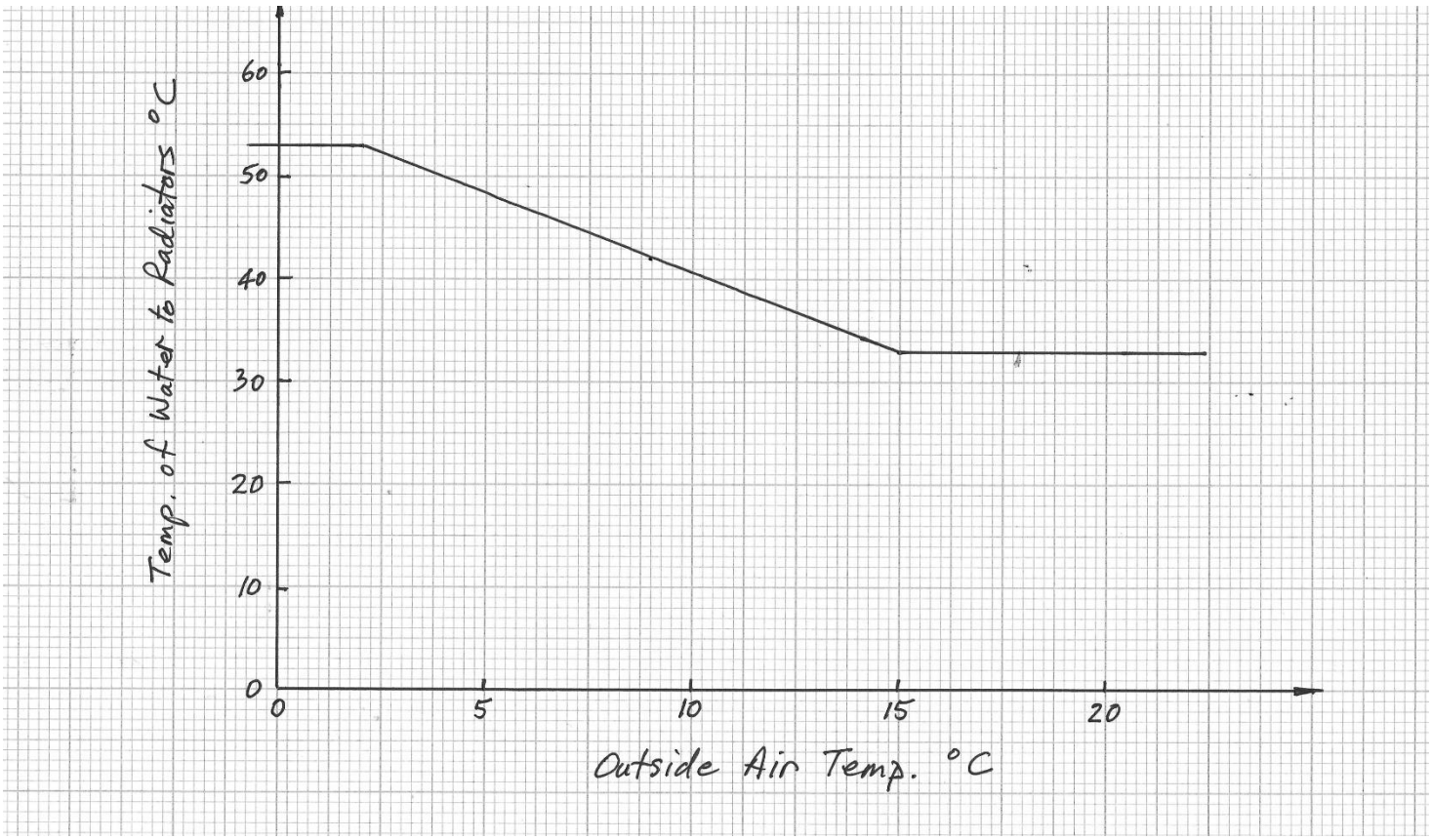
My 14 years with an Air Source Heat Pump (ASHP)

- Not noisy - newer ones near silent
- Very reliable: no routine maintenance necessary - ours recently had its first fault after 13 years of continuous use.
- Service teams are good (find via manufacturer)
- Cost: ours cost £12,000 in 2009
- Needs generous radiators (up to 70% more capacity)
- Good insulation and draught-proofing even more important with a heat pump
- Over the year, our CoP is about 2.7, and our energy consumption is 52 kWh/m^2 - UK norm is 150 to 300 kWh/m^2

Must run near continuously at lowest possible temperature, not in bursts, to be really efficient:



Weather-dependent settings:



Why heat pumps are necessary:

- Climate change target – “net zero by 2050”
- Part of Government’s Carbon Budget Delivery Plan
- Electrifying the energy system with wind, solar, nuclear, other… must happen
- Current energy use in UK: 40% in buildings; 30% in transport; 30% other – all these must go electric, and hence we need maximum efficiency
- 29 million houses already exist, most built to poor heat retention standards
- The simplest and cheapest way to solve this problem is to install ASHPs (the government gives grants of £5000 towards this)