

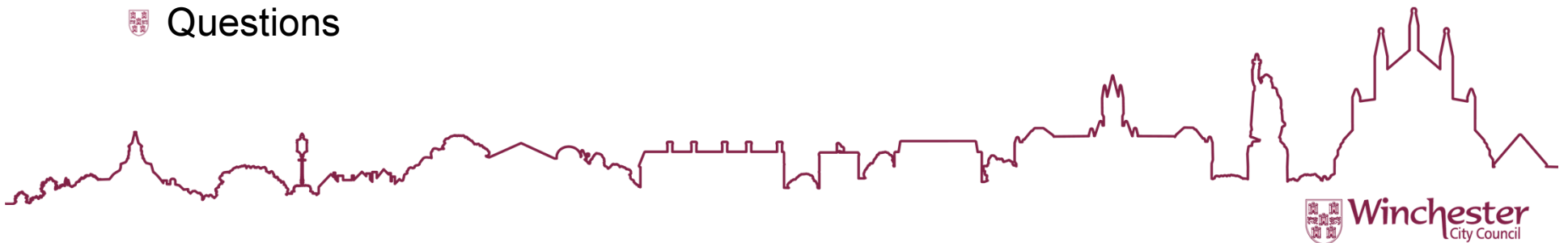
Reducing the Environmental Impact (carbon) in the Council housing stock (Part 2)

Health & Environment Policy Committee
30 September, 2020



Overview of Presentation

- 🏰 Key drivers for change
- 🏰 Re-cap on March Member/Tenant Briefing (Tuesday 3rd March, 2020)
- 🏰 Progress and actions since March
- 🏰 What would it cost to achieve carbon neutrality ?
- 🏰 Options
 - 🏰 Fabric first
 - 🏰 Improvement measures when property is void/empty
 - 🏰 Other heat sources
- 🏰 Practical/Financial considerations for tenants
- 🏰 Recommendations
- 🏰 Tenant Consultation
- 🏰 Questions



Key Drivers for Change

🏰 To support WCC`s Climate Emergency/corporate energy targets

🏰 Carbon neutral council by 2024

🏰 WCC district to be carbon neutral by 2030

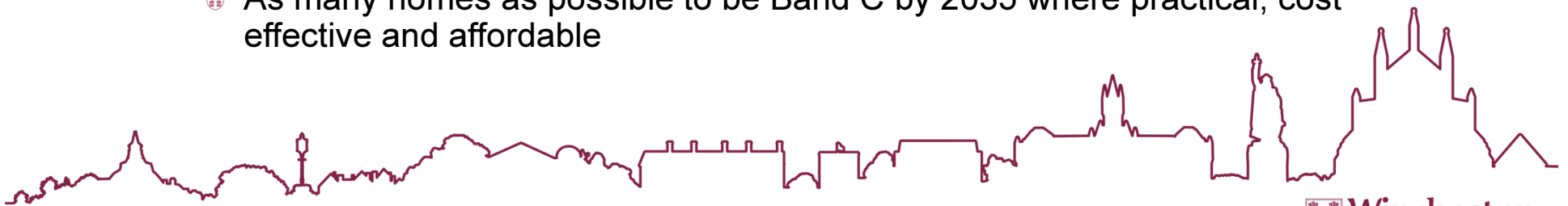
🏰 All WCC council homes to be Band C or above by 2030

🏰 National Clean Growth Strategy

🏰 Phasing out of high carbon fossil fuel off-gas heating systems during the 2020s (and to prepare the Council`s housing stock to benefit from the de-carbonisation of the electricity grid)

🏰 Improving all fuel poor homes to EPC Band C rating by 2030

🏰 As many homes as possible to be Band C by 2035 where practical, cost effective and affordable

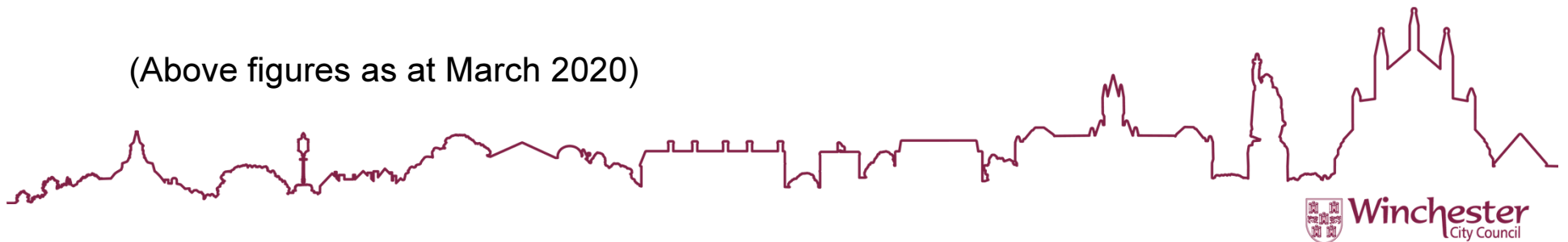


Energy Efficiency and Environmental Impact - WCC stock

Band	Energy Efficiency (Running costs) % of stock	Environmental Impact (Carbon) % of stock
A	1%	2%
B	3%	6%
C	56%	42%
D	39%	41%
E	1%	8%
F	0%	1%
G	0%	0%

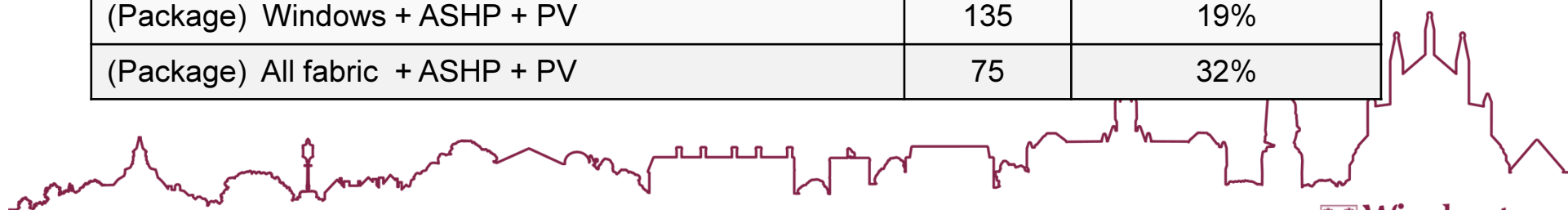
(Average – Band C) (Average – Band D)

(Above figures as at March 2020)



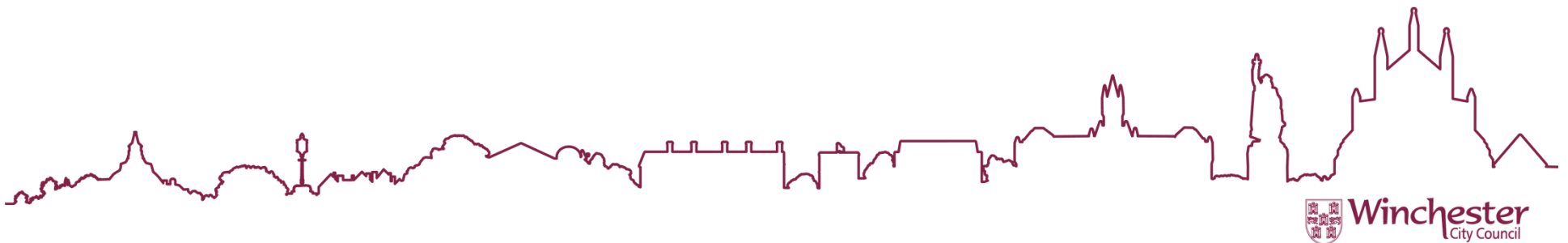
Impact on Carbon & Running Costs by spending £1m p.a

(comparison against a 3-bed-gas heated property)	Carbon Saved (t)	Running Cost (est. % saving)
(Fabric) Upgrade existing windows and doors (d/g)	22	3%
(Fabric) Upgrade existing windows and doors (t/g)	28	5%
(Fabric) Insulate ground floor	30	4%
(Fabric) External wall insulation	19	6%
All fabric	24	14%
Quantum heating	193	-33%
(Renewable energy) PV	57	19%
(Renewable energy) Solar water heating	76	6%
(Renewable energy) ASHP	228	-6%
(Renewable energy) GSHP	151	-17%
(Package) Windows + ASHP	152	-1%
(Package) Windows + ASHP + PV	135	19%
(Package) All fabric + ASHP + PV	75	32%



Progress since March Member Briefing

- 🏰 Technical energy assessments of the housing stock
- 🏰 Grant funding bids
- 🏰 HRA budget re-modelling – assessment of overall costs to achieve a “carbon neutral” housing stock
- 🏰 Ongoing Programme to install Oversized radiators, dropping flow and return temperatures to 50 degrees
- 🏰 ‘Swedish’ timber frame (non-trad) - pilot scheme



'Swedish' timber system-built homes

26 No. post-war 'Swedish' type timber homes

Basic timber framework, with external cladding (internal plaster-boarding added in the 1990's).

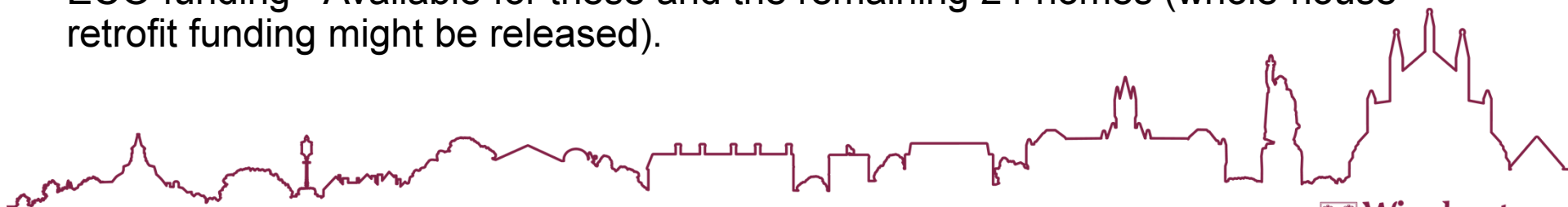
Worst energy performing homes in the housing stock (E or F)

Pilot scheme - Two Swedish homes in Bramdean.

Aim - to establish if, and at what cost, these homes can be improved to a SAP 'C' rating.

Work tendered. Pre-contract meeting this month with the successful PAS2030 accredited contractor.


ECO funding - Available for these and the remaining 24 homes (whole house retrofit funding might be released).

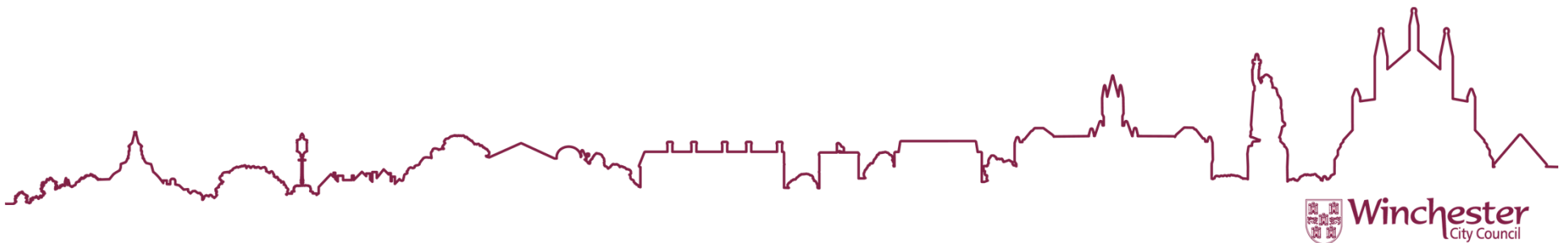


So how much would carbon neutrality cost ?

 **Gas to ASHP by 2030** - Change 1000 No. heating systems (20% of stock) from gas to ASHP (**est. cost £10m**) - estimated overall carbon reduction = approx. 16%

 **Low Carbon Heating Systems to all homes** - all Gas Boilers to ASHPs (or Quantums) at next heating change - est. **£50m** additional major works costs over 30 years

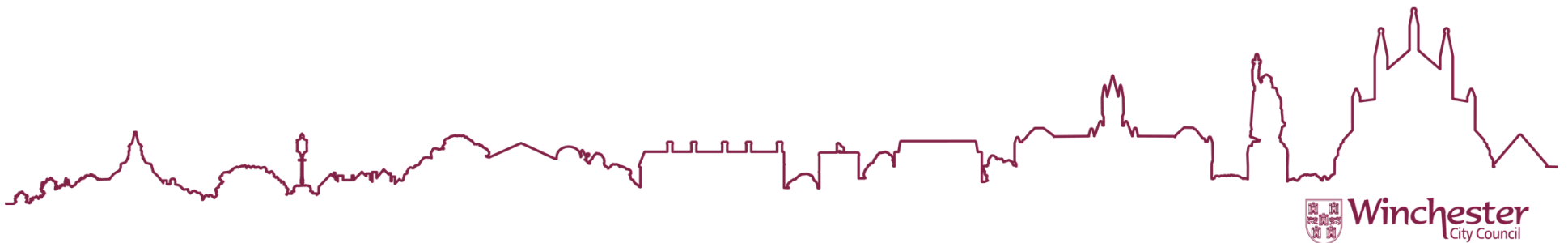
 **Package to all homes** - as above plus accelerated A+ window upgrades + Solar PV install from 2022 onwards - est. **£70m** additional major works costs over 30 years



Hierarchy of Energy Efficiency *

- Priority 1 - Reduce Energy Demand/Reduce Waste (“fabric first” approach)
- Priority 2 - Improve Efficiency of the dwelling by using more energy efficient products (boilers; wdws; doors etc.)
- Priority 3 - Provide renewables where appropriate to generate heat and/or power

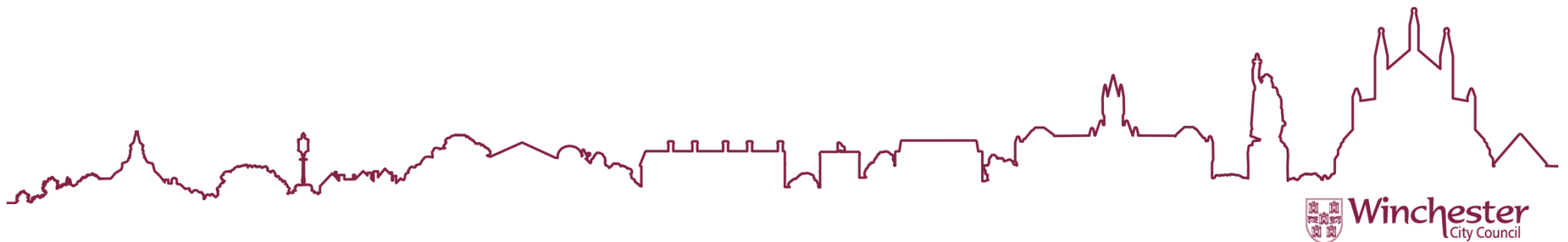
(* DECC , The hierarchy of energy efficiency was conceived as part of the Local Government Position Statement on Energy, 1998)



Fabric First

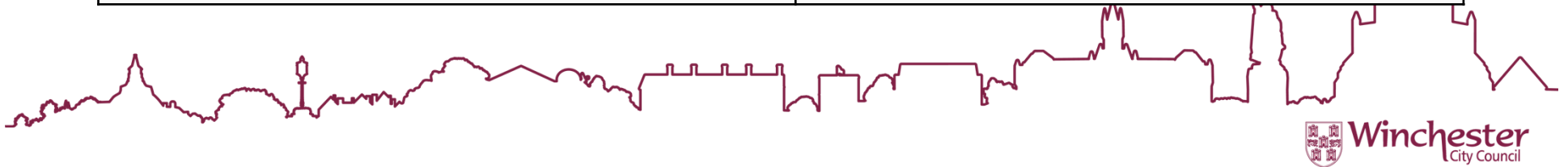
(Insulation options, estimated costs and retro-fit impact on tenants)

Insulation Element	Est. works cost (3 BED S/D House)	Proportion in existing stock (Excl. New Builds)	Retro-fit impact on tenant
External wall insulation (EWI)	£10/15,000	0%	Moderate
Internal wall insulation (IWI)	£ 5/10,000	<1%	Significant
Roof (loft) insulation (50mm+)	£ 200/£300	99%	Low
Floor insulation	£ 2/3,000	0%	Significant
Windows (new A+ rated)	£5,000	<1%	Low
External Doors (new A+ rated)	£600	<5%	Low



Improvement Measures when property is void/empty

Pros	Cons
No impact/disruption to tenant	Loss of rental income (est. 2 wks. per void)
Works completed quicker	KPI re-let time increases (est. 2 wks. per void)
Less expensive	Programme dictated by void occurrence
Property can be advertised/promoted as more fabric/heating energy efficient	Procurement restrictions?
No perceived loss of amenity	
No conservation/planning issues	
100% of funds spent on fabric/property improvements - i.e. not wasted on decant costs	
Passive and constant form of energy saving (no tenant input required)	

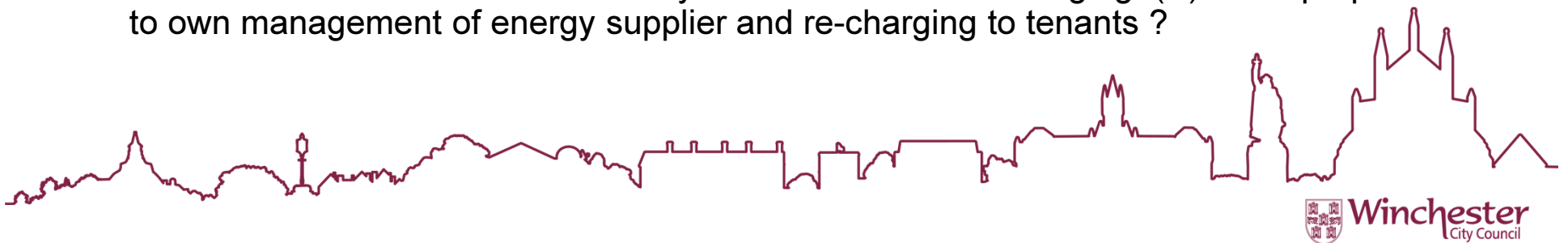


Other heating systems that show significant carbon savings (over gas systems)

- **High heat retention storage heaters (quantum)** - typically show carbon savings of approx. 50% over gas. However, the running cost for the occupants typically show a 30% increase.
- **Air source heat pump (ASHP)** - typically show carbon savings of approx. 80% over gas. However, the running cost for the occupants typically show a 6% increase.
- **Ground source heat pump (GSHP)** - typically show a similar carbon saving as ASHPs over gas (80%), However, the running cost for the occupants typically show a 17% increase. The capital installation cost is also typically 50% higher than ASHPs.

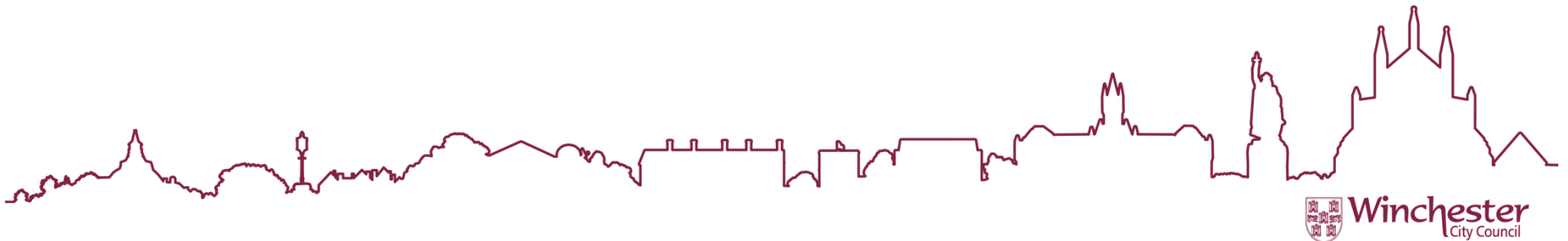
(the above running cost increases are all mainly due to current differences between gas and electricity supply charges)

- **District/communal ASHP/GSHP** - perhaps an option for blocks of flats/maisonettes - but is dependent on number of additional factors - (i) site limitations (ii) willingness of tenants to move to a communal system and central re-charging (iii) WCC prepared to own management of energy supplier and re-charging to tenants ?



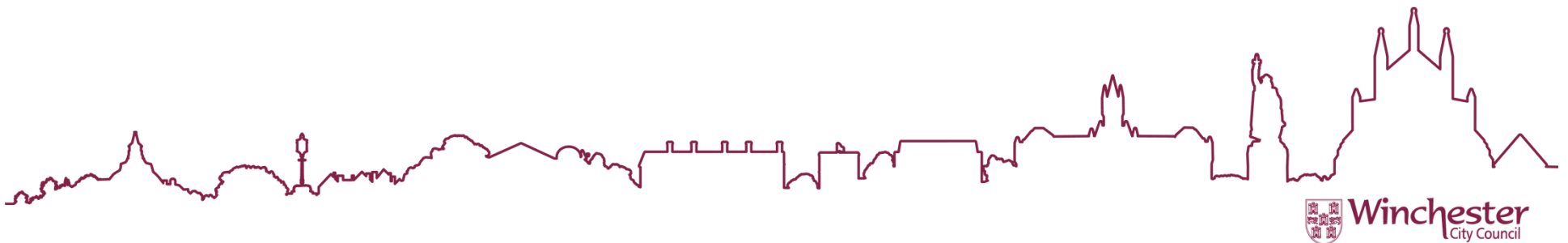
Practical/Financial considerations for tenants

- Majority of stock has gas combi boilers - so currently no hot water cylinder/airing cupboard space - ASHP and Quantum systems both require a hot water cylinder.
- Running cost of ASHP and Quantum (for 3 bed- house) typically 6% and 33% higher than gas - but degree of impact depends on existing/current system.
- Flow temperatures much lower with ASHP than with gas - so radiators have to be proportionately larger to meet same heat demand.
- Managing tenant expectations - property can appear cooler/colder due to lower radiator temperatures; unlike gas, ASHPs are not an instantaneous heat form;
- Cultural shift from combi gas systems which are the cheapest to run, space saving, quiet and very responsive



RECOMMENDATIONS

- Set aside £100k for specialist match-funded/trial projects e.g. whole house “deep” re-fits (similar to Swedish project)
- Undertake a detailed/in-depth cost-benefit analysis/review into the pros, cons and practicalities of introducing ASHP and GSHP technologies
- Engage with Southampton University on NetZeroCollective partnering initiatives and/or similar
- Target poorest energy-performing voids with a variety of fabric/heating improvement measures to raise property to Band C or above (target 100 No. p.a. where funding/practicalities allow)
- When “off-gas” systems become “beyond economic repair”, replace systems in houses, bungalows (and possibly grd flr flats ?) with ASHP and remainder with quantum heaters

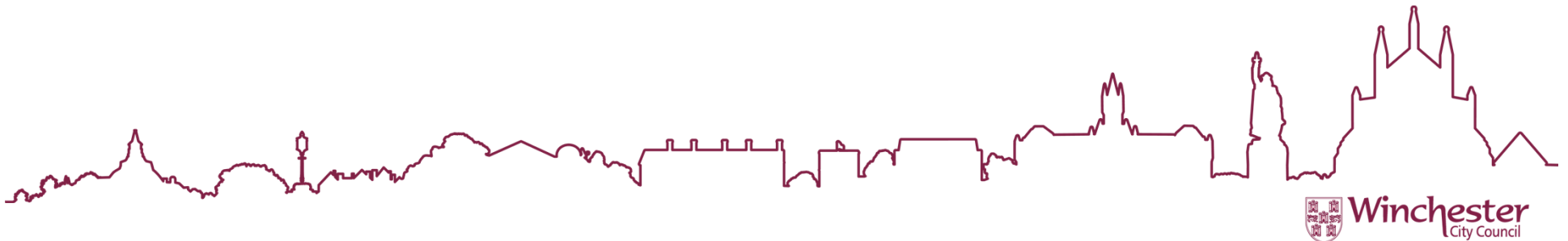


RECOMMENDATIONS (cont`d)

- As ASHP/GSHP technologies and others (e.g. hydrogen) develop and advance, move from current heating offer (of either gas or quantum only) to ASHP/GSHP or quantum only
- Encourage tenants to use green energy suppliers
- Consider de-prioritising or extending replacement programmes on other capital elements to free-up additional funding (e.g. defer programme of non-urgent roof replacements until after 2030 ?)

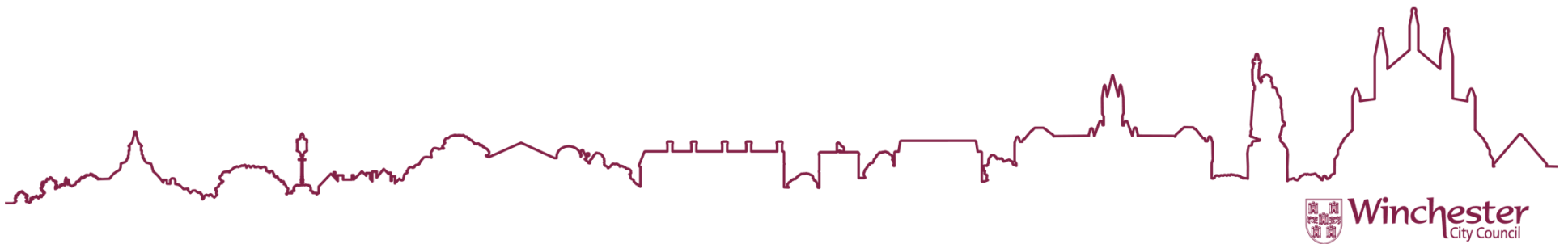
Alternative Option (not recommended)

- Tenant running costs aside, maybe shift everything over to Quantum ?
Much cheaper to install than ASHPs + can be fitted anywhere + safe + very little ongoing responsive or cyclic maintenance costs etc. - and then rely and wait on the corresponding de-carbonisation of the grid by 2030 ?



Tenant Consultation

- Presentation to TACT - 15th September,2020.
- Possible digital survey to gauge tenant opinion/preferences on possible options



Questions

