

# Road Map towards Net Zero Carbon for Cambridge City Council's Housing APSE

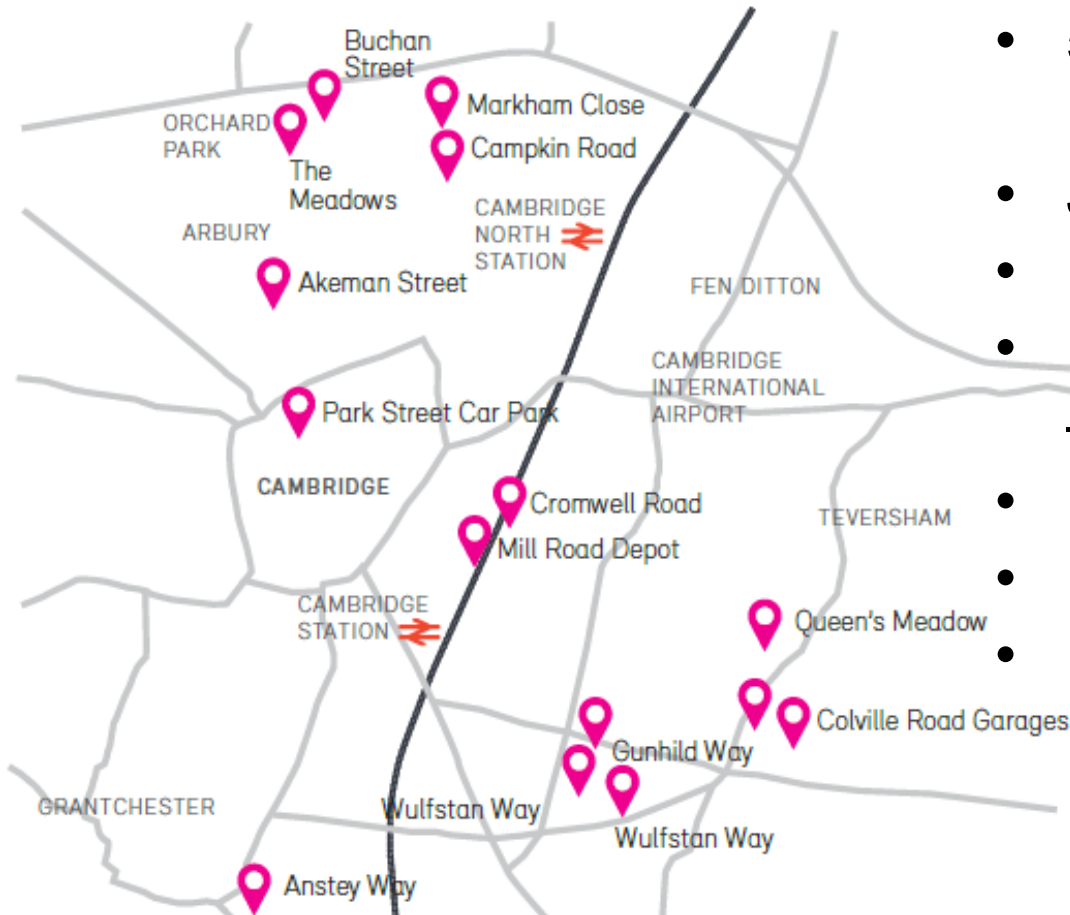
23rd June 2021



# Purpose of Today's Briefing

1. Why adopt the road map
2. How does it work and the seven principles?
3. What has been achieved
4. Where do we go from here?
5. Q&A

# 500 home programme



- 546 net new council homes
- JV partnership
- Local Plan or above
- Mill Rd and Cromwell Rd – CHP, Solar PV
- Fabric First approach
- MVHR
- Later schemes gas free



# Housing Emergency



# Policy Trade offs



## Climate emergency

- Need to reduce carbon
- Low carbon housing is more expensive
- Build less?

## Housing Emergency

- 2000 on waiting list
- Need lower energy bills
- Need to build more?

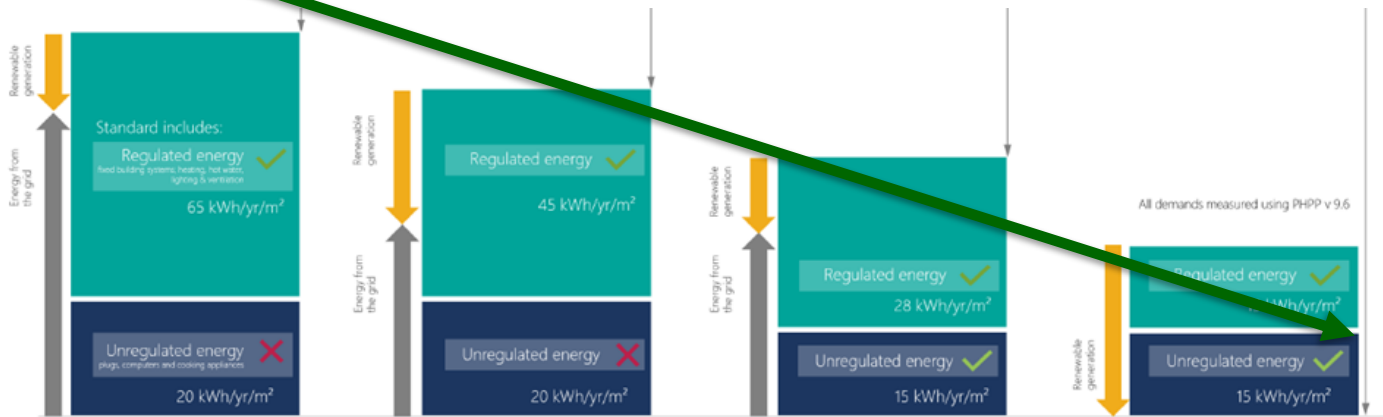
# What is the roadmap

**2020**  
National standards

**2020**  
-19%  
Cambridge Local Plan & SHDG

**2025**  
-35%  
Proposed National Standards?

**2030**  
-100%  
Proposed Cambridge Local Plan



**Gas,  
Fabric  
Solar PV**

**Gas  
Fabric +  
Solar PV +**

**No gas  
Fabric ++  
MVHR  
Solar PV**

**What is  
Net Zero  
Carbon**



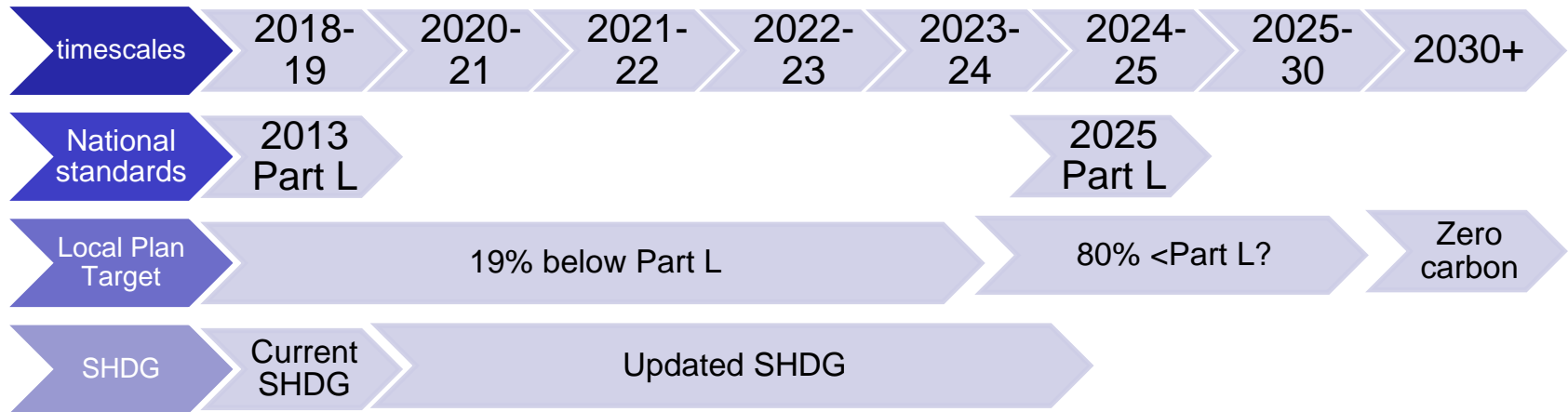
# 1000 home programme

1. 1,000 net Council rented units to be delivered over 10 years in a total programme of 1933
2. includes shared ownership/intermediate tenure and private sales/private rental schemes
3. grant support for the programme is assumed
4. Buro Happold to look at sustainability options
5. Technical constraints may restrict sustainability





# Buro Happold brief



1. Provide a roadmap to zero carbon
2. Whole Life Costs – capital costs, maintenance costs and tenant costs
3. Constraints
4. Include other sustainability measures
5. Provide guidance on options

# Passivhaus



# A zero carbon house needs zero carbon tenants and asset management

- Asset management, Housing and finance teams must be involved
- Engage with members
- Engage with tenants
- Be clear in messaging

# Adopt the roadmap to Net Zero Carbon

2020

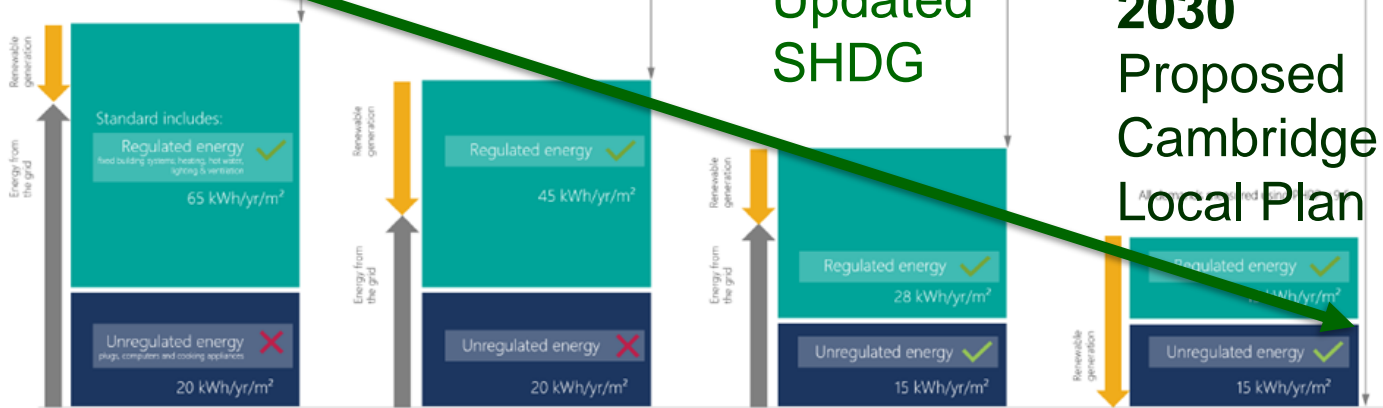
National standards

2020  
Cambridge  
Local Plan  
& SHDG

2025  
National  
Standards

2021  
Proposed  
Updated  
SHDG

2030  
Proposed  
Cambridge  
Local Plan



Local Plan

Local Plan  
Plus

Passivhaus

Net Zero  
Carbon



# Sustainable housing standard options

## Operational energy

This outlines potential standards and targets that could be applied to new council homes delivered. Standards will be applied through the 'Interim Sustainable Housing Standards 2020'. Standards focus on operational energy, the energy used for living in a home from fixed heating, hot water, lighting, ventilation, plugs, cooking and appliances. It however excludes consideration of electric vehicle (EV) charging.

### 1. Existing Local Plan

Homes will require:

- Typical energy efficiency
- Gas fuelled heating and hot water
- Solar technologies for energy generation

### 2. Local Plan Plus

Homes will require:

- High levels of energy efficiency
- Heat pumps for heating and hot water
- Solar technologies for energy generation
- Hot water store with WWHR

### 3. Passivhaus Certification

Homes will require:

- Ultra-high levels of energy efficiency
- Electric heating and hot water
- Solar technologies for energy generation
- Hot water store with WWHR

### 4. Net Zero Carbon on-site

Homes will require:

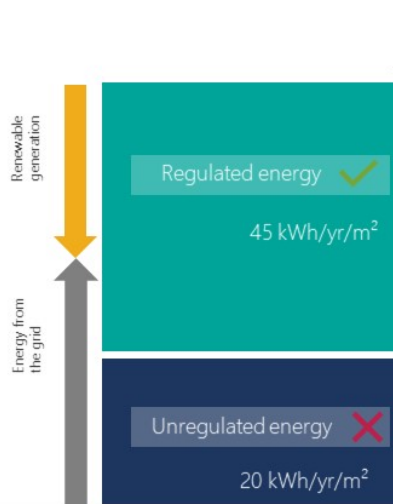
- Ultra-high levels of energy efficiency
- Heat pumps for heating and hot water
- Solar technologies for energy generation
- Batteries for energy storage

Building Regulations Part L baseline  
Current UK Government legal requirement for new homes

Carbon reduction Part L 2013 = **19%**  
Carbon reduction SAP 10.1 = **19%**  
Capital cost uplift beyond typical = **0%**  
Typical annual maintenance cost = **~£800/yr**  
Typical annual energy cost = **~£600/yr**



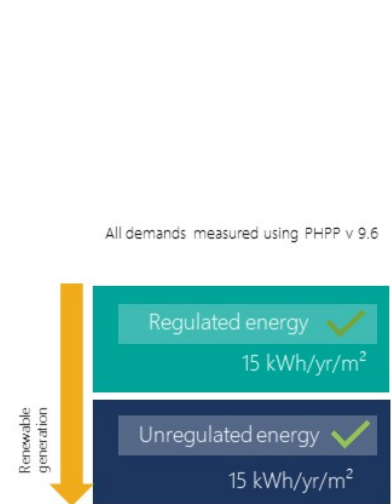
Carbon reduction Part L 2013 = **35%**  
Carbon reduction SAP 10.1 = **80%**  
Capital cost uplift beyond typical = **3%**  
Typical annual maintenance cost = **~£900/yr**  
Typical annual energy cost = **~£600/yr**



Carbon reduction Part L 2013 = **35%**  
Carbon reduction SAP 10.1 = **80%**  
Capital cost uplift beyond typical = **20%**  
Typical annual maintenance cost = **~£1,000/yr**  
Typical annual energy cost = **~£400/yr**



Carbon reduction Part L 2013 = **100%**  
Carbon reduction SAP 10.1 = **100%**  
Capital cost uplift beyond typical = **29%**  
Typical annual maintenance cost = **~£1,900/yr**  
Typical annual energy cost = **£350/yr**



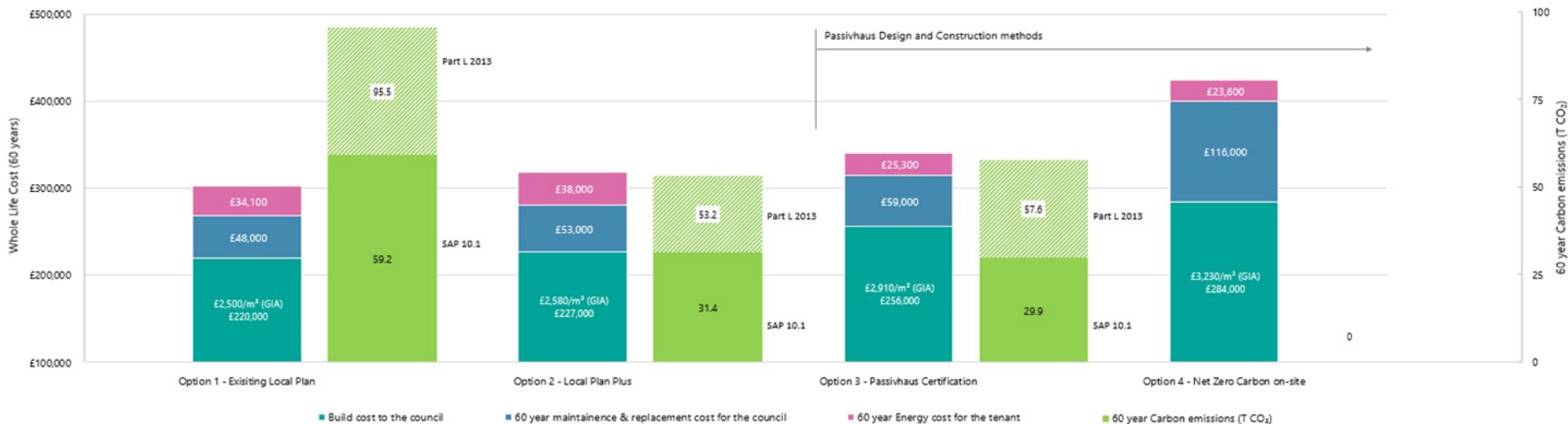
# Cost, tenant bills and carbon trade off

## Local Plan

## Local Plan Plus

## Passivhaus

## Net Zero Carbon



Fabric ++  
Technology +++

**Risk:**  
E&F: +++  
Contractor: +  
Tenant: +++

Fabric ++++  
Technology ++

**Risk:**  
E&F: ++  
Contractor: +++  
Tenant: ++

Fabric ++++  
Technology +++++

**Risk:**  
E&F: +++++  
Contractor: +++  
Tenant: +++++

# Recommended Principles for Sustainability for New Housing Programme 2022-32

This briefing paper proposes that the following are adopted for the new programme as part of an updated Sustainable Housing Design Guide:

1. the roadmap to Net Zero Carbon
2. the process map in decision making on sustainability
3. the 7 sustainability principles



# What does this mean?

All council new builds built to:

- **Net Zero Carbon from 2030**
- **Passivhaus certification from 2021**
- Sustainability Options appraisal for every development to include:
  - Future proofing all schemes to Net Zero Carbon when funds permit
  - Technical and financial justification for not attaining Passivhaus





# Adopt the roadmap to Net Zero Carbon

Summaries	Current Local Plan (2018)	Local Plan Plus	Passivhaus	Net Zero regulated Energy / Carbon
<b>Water Summary</b>	110 l/p/d	90 l/p/d	90 l/p/d	80 l/p/d
<b>Overheating Summary</b>	Recommended but not mandatory to use TM59	Mandatory use of TM59	Mandatory use of TM59	Mandatory use of TM59
<b>POE Summary</b>	Recommended through SHDG but not mandatory	POE for first year of occupation	POE for first 5 years of occupation.	POE for first 5 years of occupation.
<b>EV Summary</b>	SPD: 50% active and 50% passive charging points.	SPD: 50% active and 50% passive charging points.	50% active and 50% passive charging points.	50% active and 50% passive charging points.
<b>Car Parking ratios across sites</b>	~0.7-0.9 parking spaces per home	~0.5-0.6 parking spaces per home	0.5 parking spaces per home	<0.5 parking spaces per home
<b>Car Club</b>		Increased Car Club provision	Increased Car Club provision all with active charging	Increased Car Club provision all with active charging
<b>Biodiversity Summary</b>	Flat roof must be green roof  10% net gain in biodiversity	Flat roof must be green roof  10% net gain in biodiversity (DEFRA)	All Flat roofs to be extensive (Sedum) green roofs.  20% improvement in biodiversity (DEFRA)	All Flat roofs to be extensive (Sedum) green roofs.  20% improvement in biodiversity (DEFRA) All features with habitat value to be retained

# Constraints

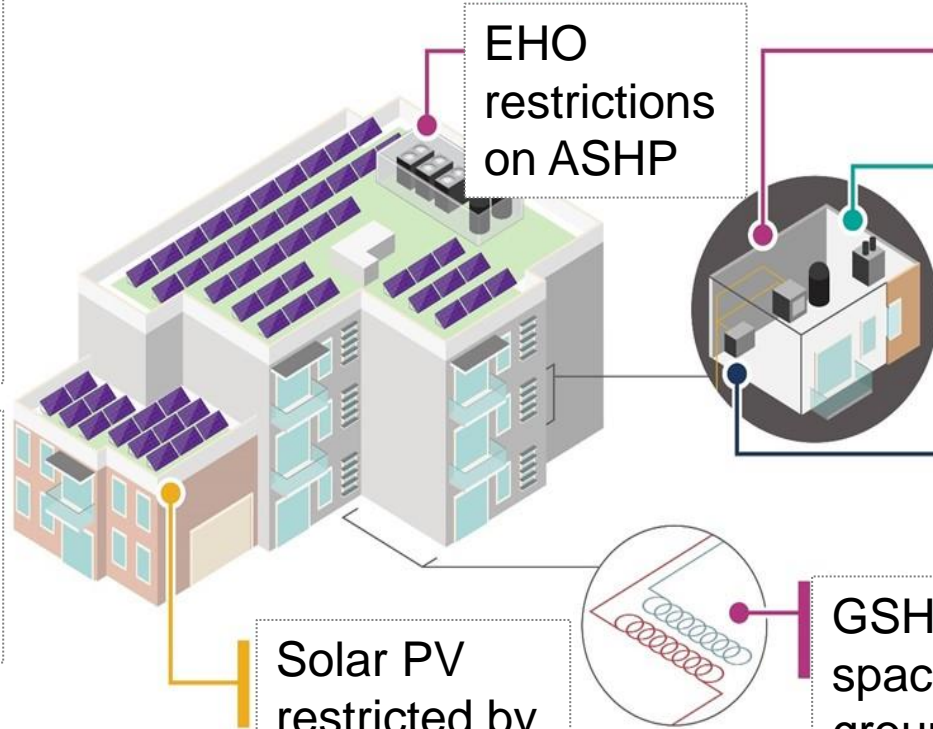
Difficult to control tenant behaviour

Energy and carbon reduction limited if tenants and E&F are not able to operate or maintain new technology

Not all sites suited for Passivhaus due to orientation, other design and planning constraints

Council will have less design control over S106 sites

Limited experience from designers, contractors and supply chains



EHO restrictions on ASHP

Significant storage space required for technology

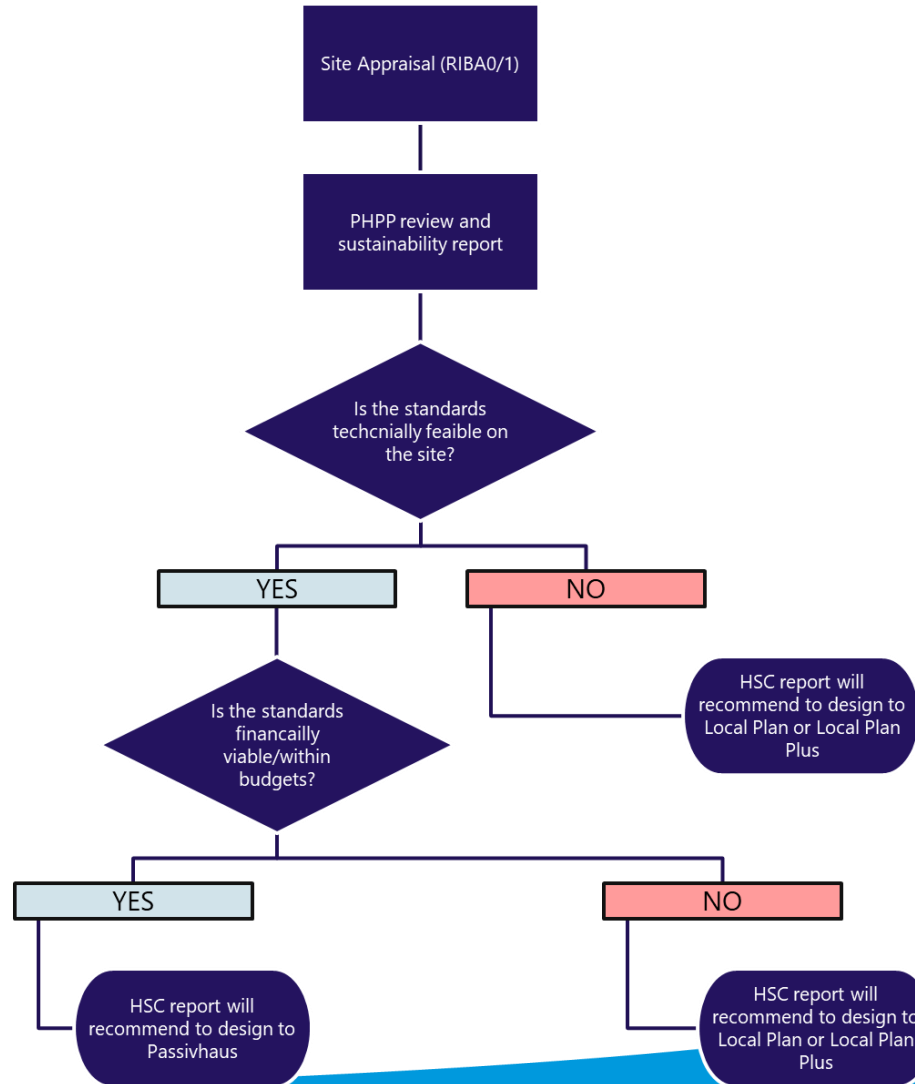
Solar PV restricted by roof space

GSHP need lots of space or the right ground conditions

Water restrictions and lack of car parking may be unpopular

Biodiversity easier on brownfield and greenfield sites but not overgrown sites

# Decision making on sustainability



# Seven principles of sustainability

**Principle 1: ensure all schemes undertake a Passivhaus Planning Package (PHPP)**

**Principle 2: start Passivhaus and sustainability standards now developing house types**

It is recommended that the first step is to design to Passivhaus on a smaller simpler sites starting with developing house types

**Principle 3: ensure all new builds can be retrofitted, where possible, in the future, to Net Zero Carbon**

It is recommended that the Council ensure that all new developments are future proofed to allow technologies to be installed to make them Net Zero Carbon in the future **subject to technical and financial constraints**



# Seven principles of sustainability

**Principle 4: design and build to Net Zero Carbon only when costs allow and after learning to build Passivhaus schemes**

**Principle 5: ensure training is provided to upskill Council departments and tenants to understand Passivhaus technologies**

**Principle 6: complete the review on the capital, maintenance and tenant costs in retrofitting current housing stock to Passivhaus**

This will allow the Council to make an informed decision on reducing carbon emissions for all its housing stock.



# Seven principles of sustainability

**Principle 7: adopt Passivhaus certification as the Council's sustainability standard for all Council developments when it is technically and financially possible**

## **HOWEVER**

Where there are technical and financial constraints to developing designs to Passivhaus allow flexibility to proceed to Local Plan and Local Plan Plus, but to demonstrate how a similar level of carbon reduction can be attained



# Thank you for listening

## Any questions?

