

Annex 6 – Future scenarios: Big Ideas workshop

This Annex reports back on the 'Big Ideas' workshop held in London on the 27th November 2006. The Big Ideas project (formally entitled "Sustained competitiveness in the UK construction sector: a fresh perspective"), is a three-year research project funded by the Engineering and Physical Sciences Research Council (EPSRC) involving the Universities of Loughborough, Reading and Salford. The Loughborough research team is tasked to explore the issues that will impact the construction industry in the next 10 to 20 years and to enhance the understanding of these important issues by investigating their interconnectivities as perceived by key industry stakeholders and decision makers.

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This Annex contains:

- A6.1 Introduction
- A6.2 Delegates responses to the scenarios
- A6.3 Conclusion

The information presented in this Annex is based on research completed before August 2007. Some of this information may, therefore, have been superseded.

For definitions of terms and abbreviations used in this Annex, please see the main CRW roadmap document.

A6.1. Introduction

Twenty-three delegates attended the workshop representing clients, contractors, consultants, manufacturers and trade bodies. The delegates were asked to choose a theme which they felt comfortable to discuss and interested in, out of eight predetermined themes. Those who choose the same theme were asked to form a group. Six groups were formed to suit the research methodology. The six themes selected were:

1. Increased adaptable and flexible buildings to meet climate change and function requirements.
2. Increased demolition of buildings to meet energy efficiency standards.
3. Increased energy efficiency of buildings and built environment.
4. Increased emphasis on recycling and reuse on new build.
5. Increased consideration of whole life costs in the development of the built environment.
6. Increased emphasis on reducing material waste on new build houses.

The delegates were guided through the steps of constructing a 'causal map':

- identifying (i.e. brainstorming) emerging issues and goals relevant to the theme
- mapping out these issues to achieve a particular goal in a timeline from now (2006) to an envisaged future (e.g. 2026)
- identifying barriers (and enablers) that relate to the issues and goals
- drawing causal links representing cause and effect relationships between issues, barriers, enablers
- identifying alternative pathways (or scenarios) to achieve goal within the causal maps.

During the session, group members were encouraged to discuss, debate and challenge as well as reconcile ideas and issues.

After the workshop, the research team analysed the 'maps' generated using sticky notes, to create digital causal maps. A causal map depicts the cause and effect relationships between events within a particular theme.

A6.2. Delegates responses to the scenarios

1. Increased adaptable and flexible buildings to meet climate change and function requirements

The overall aim of this scenario is to try and achieve the government target of reducing CO₂ by 60% by 2050 by the use of adaptable and flexible buildings.

Note that these are the views of the delegates working on this theme.

There are two starting situations, namely 'existing homes' and 'new build'. 'Existing homes' are being upgraded but this tends to be wasteful because they were not designed to function under these changing climates and requirements.

'New build' homes are also being built, but design adaptability and flexibility do not really feature as part of the whole range of things that are being considered. The two situations where we want to get to in the future are:

- all new houses will be 'designed to be adaptable'
- houses that are already built are 'upgraded or removed'.

Existing homes that need to be upgraded or removed can be classified into private, social housing and demolition routes. Decision will have to be made as to which houses need to be demolished. In the social housing route, there are homes of a decent standard which are rising to a certain quality of living, but as new technologies and new standards are coming in, in terms of what is acceptable building, these will still need a whole programme of upgrading, so that e.g. by 2025, all social housing will have been upgraded so that they perform to an acceptable level of performance in terms of energy efficiency, adaptability, etc. In the private housing route this will be via the objective of changing attitudes in terms of the home and how it will perform in the future. Improvements here will require incentives, e.g. stamp duty differential. Recognition is needed that people will work from home a lot more in the future, so increasing the importance of homes being adapted to make them more efficient. Government support and funding is very important to all of these if they are to happen (both private and social housing sectors).

In the 'new build' or future homes route, an update or Code for Sustainable Home Part 2 was foreseen, which looks at adaptability along with all the other issues. This will lead to the whole raft of design standards and building regulations that set standards in terms of new homes and how they can be adaptable going into the future. At a 'decision point' in the future, it will be a case of lightweight homes that are semi-disposable versus very durable homes that are built to adapt for a very long period of time (though the inside may change quite dramatically, the shell is durable enough to withstand a dramatically changing climate).

Adaptable homes need the users to 'know' the building and how it performs, via training, awareness-raising and handover packs, so when the house is sold on, everybody is aware of what has already happened to it and how it performs under different circumstances. The overall objective is to get 90% of all new homes to be adaptable in the face of future climate change and changing use of the building.

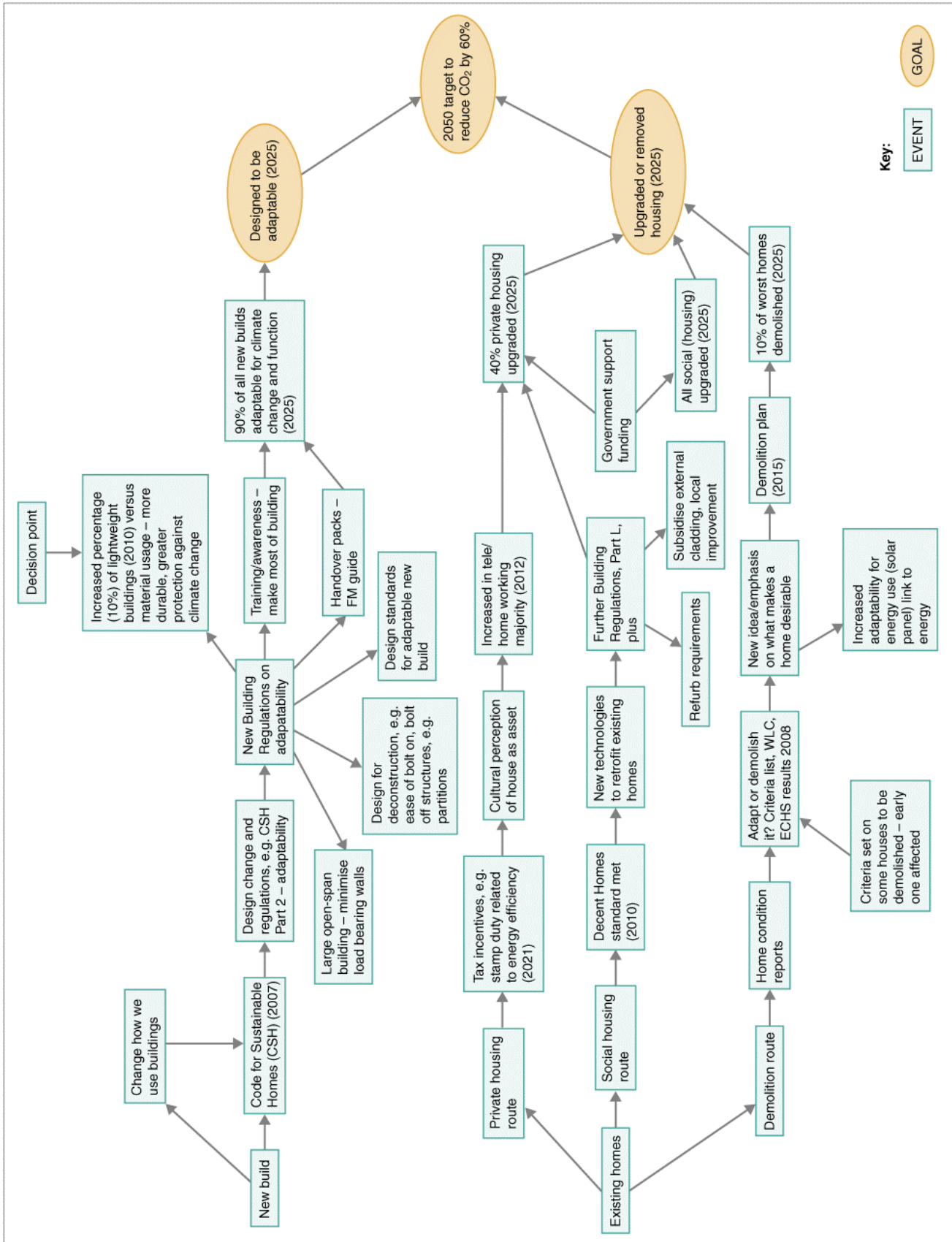


Figure 1 Causal map of increased adaptable and flexible buildings

2. Increased demolition of buildings to meet energy efficiency standards

Note that these are the views of the delegates working on this theme.

Currently, there is a great deal of demolition, low levels of reuse, recycling and landfill tax, social engineering, and a government planning policy which makes new development more desirable than recycling. Currently, only 1% of the total market in construction materials is reclaimed and 95% of all reused or reclaimed materials are used outside of mainstream construction. Our goal in 2026 is:

- no unnecessary demolition
- when demolition must occur, deconstruction, reuse and recycling of materials must be maximised
- towards a zero waste approach.

There are three main scenarios regarding recycling, reuse and refurbishment. In the refurbishment 'strand', there is a trend, or increasing fashion, towards reused or older buildings, both individually and corporate. There are increasingly innovative solutions for energy efficiency in retrofitting and refurbishment. This leads to more refurbishment and hence less demolition. In the recycling and reuse 'strands', the main issue is the embodied energy implications. In other words, a good understanding of where it is best to recycle or reuse.

In the recycling 'strand', the key issues identified are the standards for reclaimed materials; that is achieving 'wider' standards, or parameters of function, which is really important. There has been a great deal of research in this area by various bodies such as BRE, universities and trade associations. Other issues which will help to move things forward include: PFI guidance which mandates the use of reclaimed/ recycled materials; increasing customer confidence to use reclaimed materials; much more client demand to reuse and recycle in new builds; and more flagship 'zero waste' or 'waste neutral' developments. These will all help lead towards better deconstruction.

In the reuse 'strand', there are many factors which are within the recycling 'strand'; some of these include tax credits for recycling and reuse, the successful education of builders, more client demand, an increasing number of social enterprises that are not for profit, and a 'successful' landfill tax.

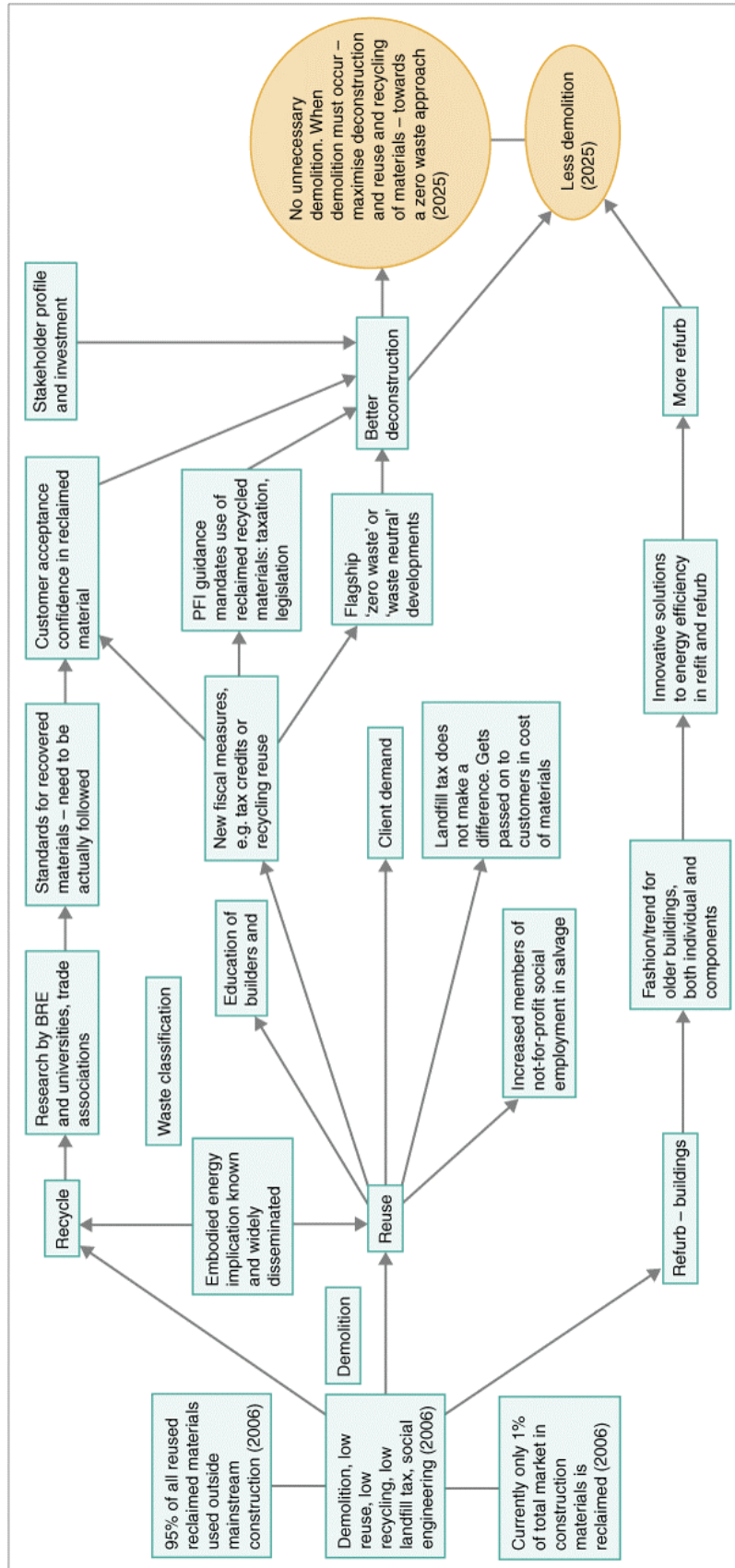


Figure 2 Causal map for increased demolition of buildings

3. Energy efficiency

Note that these are the views of the delegates working on this theme.

The starting point is the big issue with existing housing that the government needs to tackle. This includes building regulations, lack of skills in certain areas and so on.

The goal is that in 2016/2017 all new buildings/ homes are low or zero carbon (LZC) and existing housing are refurbished and aiming for a 50% CO₂ reduction. However, a great deal needs to happen between now and 2016/2017.

- For the skills base, gaps need to be identified, along with actions to fill them. This leads to a target for CITB, i.e. supply enough skilled labour to meet demand by 2011/12.
- Better public information awareness of energy efficiency is needed, along with more engaging initiatives for energy, water and waste. This leads to a cultural change where efficiency becomes a 'must'. If this occurs, then reaching the goal is more likely.

The other theme is related to fiscal initiatives and penalties required. Energy Performance Certificates (EPCs) are coming in June 2007 for all housing being constructed/sold/rented. The re-evaluation of council tax will stipulate a lower banding for energy efficiency homes. Linked to that is the need for better metering of energy, i.e. smart metering, where people can see exactly how much energy they are using, which could be compulsory for all new buildings. (It will become mandatory for all new public housing to achieve level 3 in the Code for Sustainable Homes (CSH) in April 2007.) The plan is to make this mandatory for all new housing to have it by April 2008. The long-term intention is to bring whole life costs/ impacts into the building regulations by 2011/12, which will eventually lead to lower or zero carbon buildings.

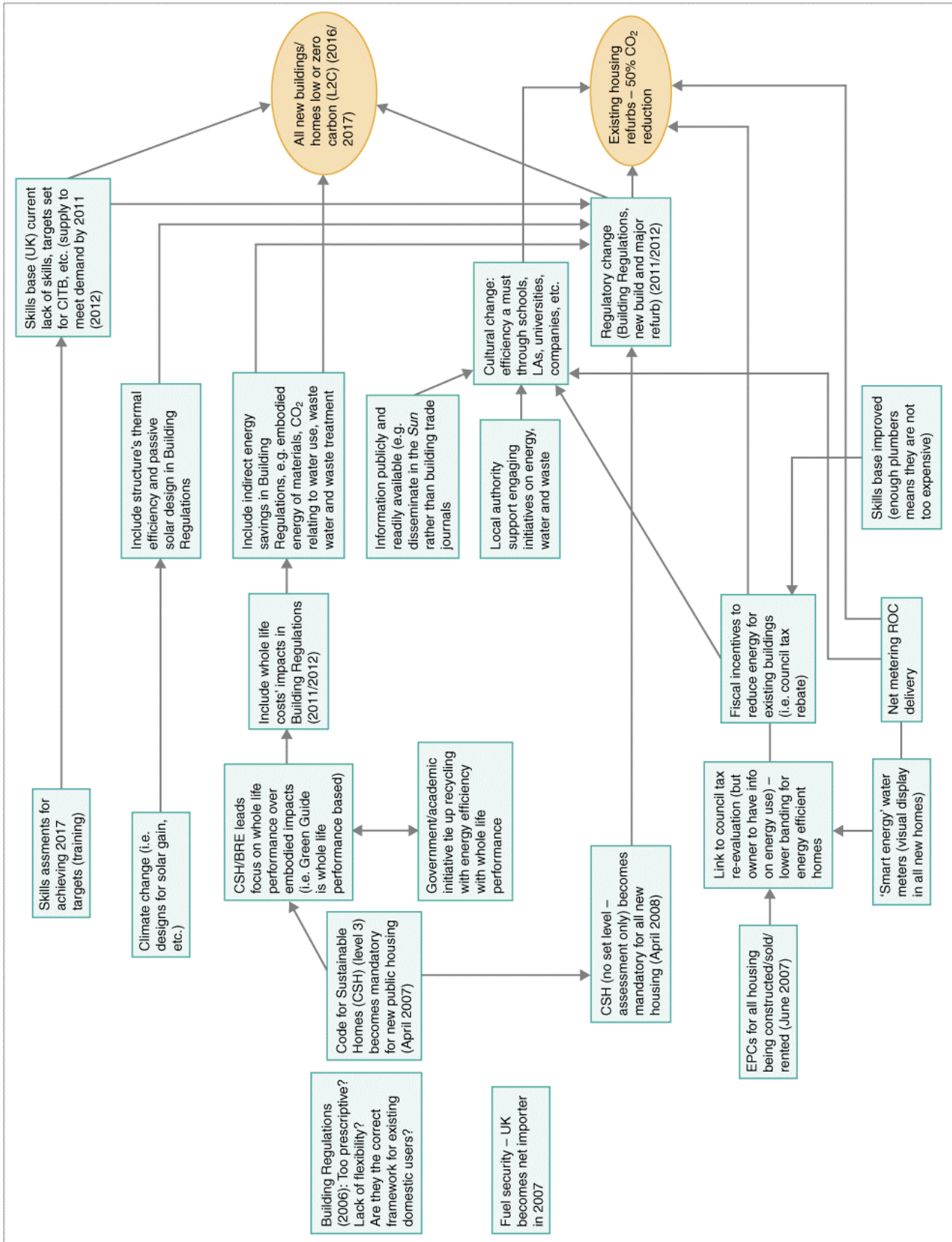


Figure 3 Causal map for energy efficiency

4. Increased recycling and reuse

Note that these are the views of the delegates working on this theme.

There are a number of current factors that come into play at the present time – namely time, cost, regulation, supply, demand, planning, professions, contractors, process, and specification. These are all complex aspects and issues that can impact on recycling and reuse outcomes. The first ‘theme’ is a regulatory, market- and planning-based theme, and how they relate to the actual specification of products. All of these factors interact throughout the scenario and ideally a point will be reached where they are all harmonised, as there is a current lack of joined-up thinking and actions.

In the future, there should be clear regulations relating to high-specification materials and dealing with the risks that arise from the process (e.g. quality).

Clear policies and guidance that will eventually harmonise with the building regulations need to be developed, taking into account planning, the professions and contractors. This will lead to ‘greener’ procurement which will draw in these new specifications and processes.

Recycled and reused material needs to be as good as (or better than) the virgin material and meet the relevant standard; and people’s behaviour needs to be changed. This will influence supply chain reactions, which (when monitored) will be a measure of success. If this is working, then there is a harmonising of all issues in order to reach the goal, i.e. 80% of new build waste to be recycled and reused, and 30% of new build to be derived from reused/ recycled materials.

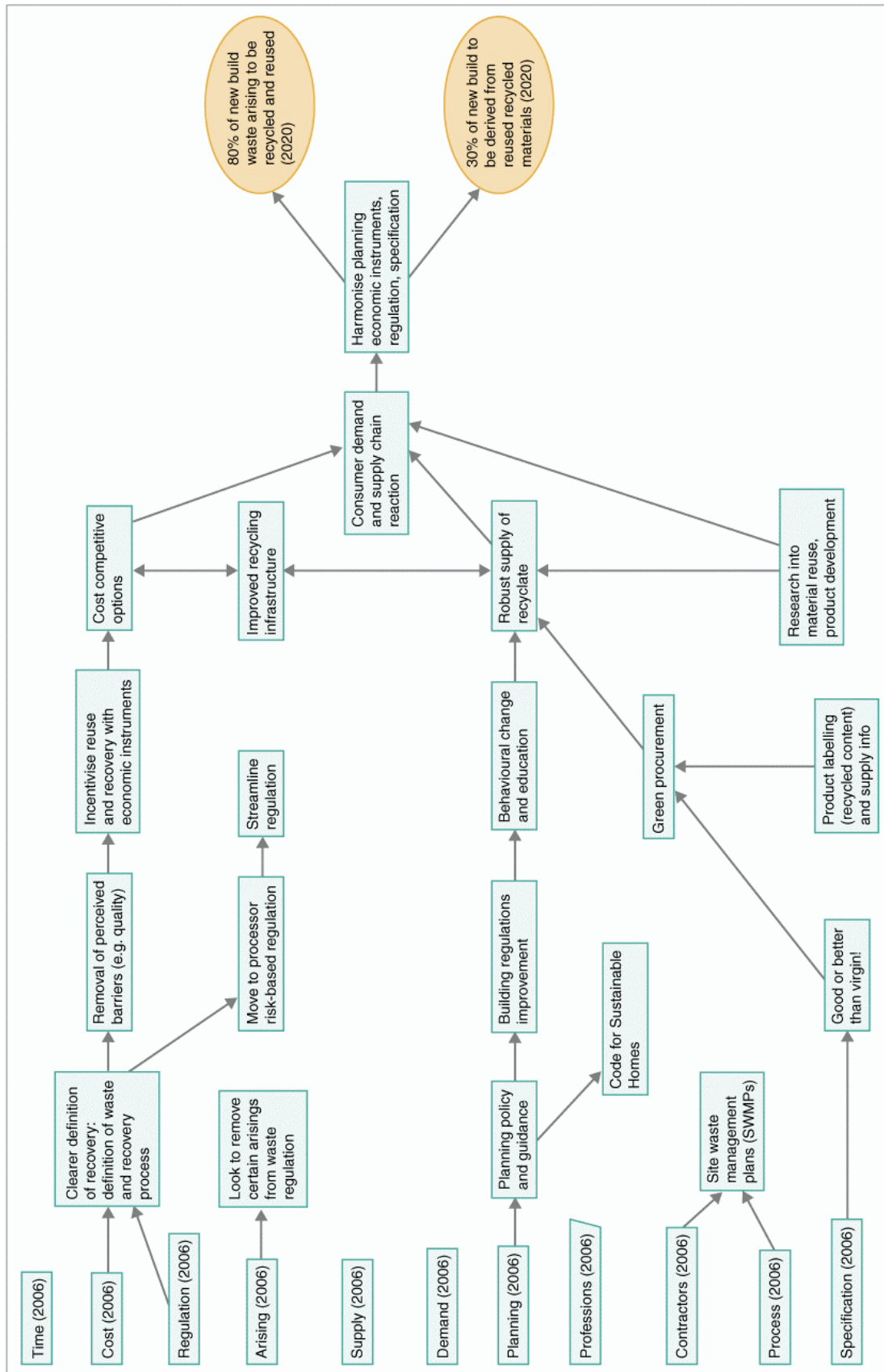


Figure 4 Causal map of increasing reuse and recycling

5. Whole life costs

Note that these are the views of the delegates working on this theme.

Currently, more joined-up thinking on whole life costs (WLC) is required, and there is a need to review the knowledge of the approach and the tools regarding WLC. The final goal is a low carbon built environment in 2020.

There are many current barriers within the bounds of a 'critical appraisal of current influences and practices', as so many pressures try to push people in one direction while influences pull them in another direction. Two main separate 'streams' of events exist:

- tools and regulations
- knowledge and training/education.

The industry should develop various tools, such as 'pre-project needs analysis' based on WLC (i.e. analyse needs based on a WLC perspective and find the best way to satisfy). The boundaries of WLC also need to be agreed.

It should be ensured that building regulations do not create barriers to the use of different options for being highly efficient on a WLC basis. For example, if new materials come along that offer novel advantages, their use should not be prohibited by building regulations.

Once the boundaries have been agreed, the development of sectoral tools to model WLC scenarios is required so that people can actually work out where they are and what the impact on their building is, and how they are going to change it ('what-if' scenarios). WLC should be undertaken at the pre-award stage, design stages and post-construction, to make certain that the whole design and construction procedure involves WLC.

To obtain planning permission should require the use of WLC, and incentives provided if necessary. WLC should also be part of the construction contract and separate capital expenditure and operational expenditure budgets should be avoided.

Along the parallel training 'stream', we should train the workforce to understand WLC and perhaps, designers' remuneration should be varied so that they get incentives to design buildings based upon WLC principles.

Approaching 2020, there should be fiscal penalties for the adoption of poor WLC options; government projects to only be funded if all project costs (>£4 million); identify WLC benefits over a 10 year period; and a suitable format of reporting WLC is displayed on public buildings. This will then mean client awareness as well as awareness within the general public. All these feed towards the goal of a low carbon built environment.

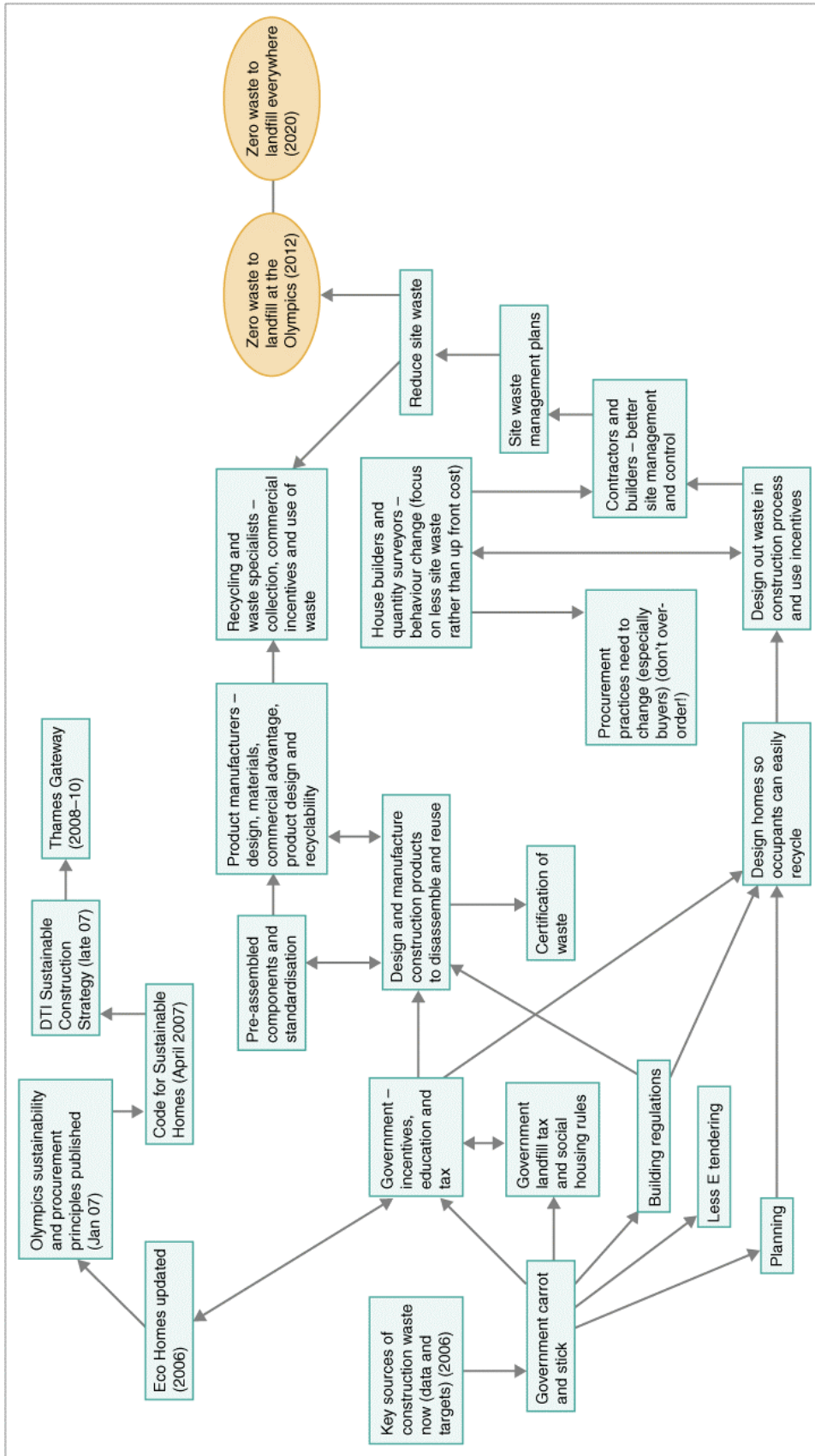


Figure 5 Causal map for Whole Life Costing

6. Reducing material waste on new build

Note that these are the views of the delegates working on this theme

The ultimate goal for this scenario is zero waste to landfill by 2020 for all of UK construction. This was included in the DTI Review of Sustainable Construction 2006 as part of the vision for the industry. An earlier (preliminary) goal would be to deliver the landmark Olympics project as zero waste by 2012. To achieve these goals, however, current key sources of construction waste data need to be measured in order to set measurable targets for the future. This is recognised as a priority in the new Waste Strategy for England.

The government needs to take a lead as soon as possible with various 'carrot and stick' initiatives in order to instigate change by using education and tax (e.g. landfill tax), building regulations and planning policy.

Several government initiatives are already in motion, such as the EcoHomes standard. This will be followed soon by initiatives such as the Code for Sustainable Homes and the DTI Sustainable Construction Strategy. These initiatives will all influence the Thames Gateway development to be constructed in 2008–10, which will go part way towards being zero waste.

These government initiatives, together with public and industry pressure, will begin to instigate change, both in the design process and on site. Designers and manufacturers will begin to produce construction products which are able to be disassembled and reused, as well as more pre-assembled and standardised products. Increased regulation and increased product standardisation and reusability will lead to homes being designed that can be more easily recycled by their owners and which produce less waste in the construction process.

These developments will contribute to a behavioural change in house builders towards waste which will lead to better (and less wasteful) procurement practices and site management and control. All of this will contribute to reducing the overall amount of waste produced. This reduction will both create a market for recycling and waste specialists who will feed back this 'waste' into the construction product manufacturers, and which will also lead towards the ultimate goal of zero waste to landfill at the Olympics in 2012 and in all UK construction by 2020.

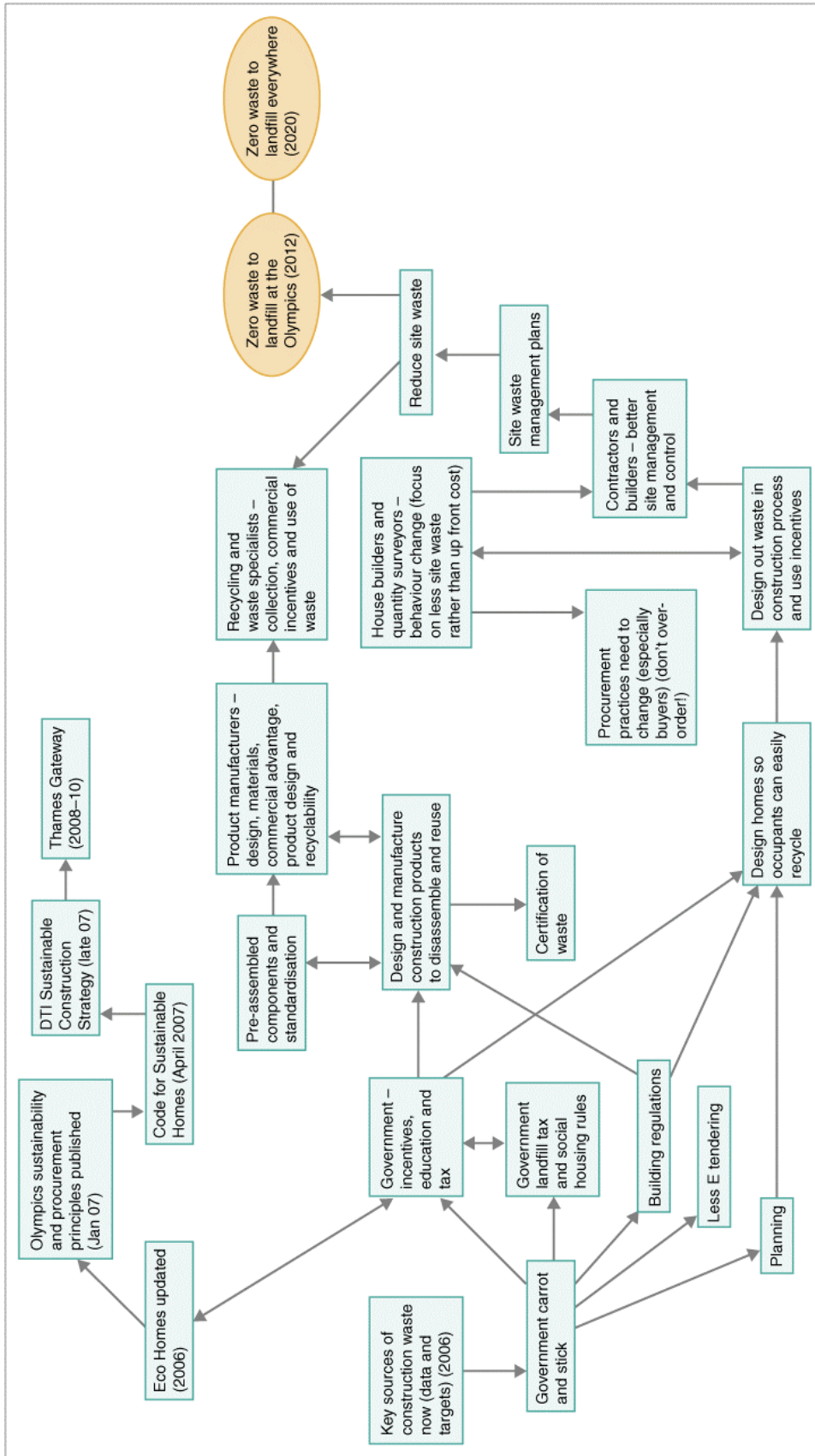


Figure 6 Causal map for reducing material waste on new build

A6.3. Conclusion

These causal maps provide a useful snapshot of current views and give some very good steers on how future construction resource efficiency can be positively influenced. They also show that the level of awareness of the issues from the, largely industry based, stakeholders is high and this should be reflected in related policies and support, i.e. a lot is already happening and focus should be on increasing momentum.