

## 10. Energy efficiency is not being embraced to the required degree due to political, financial and cultural drivers despite significant savings potential.

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### What makes this problem unsolvable?

The developed world has a vast installed stock of inefficient equipment, process and buildings. The driver for making these things more efficient is the operational cost of the machinery. Often this is not a driver when equipment is purchased and the cost of energy has been too low for consumer to worry about operational costs.

### Problem Description

A significant degree of the energy we use goes to power inefficiencies, both in terms of systems, processes and equipment. The push for energy efficiency was first promoted as the result of the oil shocks during the seventies, and there were significant improvement in efficiency in both equipment, motors and cars. However, the push for efficiency stalled for a number of reasons. Firstly, energy prices reduced and energy has been relatively cheap, hence consumers didn't particularly care how efficient equipment was when they purchased it.

The drive for efficiency came more pressing in terms of labour costs so businesses often traded labour costs for energy intensiveness. Politicians avoided the topic because business didn't want to be burdened with regulation, which may make them uncompetitive.

There is sometimes a belief in policy circles that if efficiency improvements were possible, they would have happened as a natural consequence of procurement decisions. Sadly, such theories are not translated into practice for a number of reasons.

There is also a risk averseness that has made most processes and equipment over designed for actual need. Equipment is typically sized for the worst potential use, then added to by 30% just in case. This was a common rule of thumb for equipment specs. This means equipment is sized for conditions it is likely to never encounter.

The type of equipment, particularly cars, heavy machinery and buildings, have a long life span so the stock stays around for a very long time. Often it only makes economic sense to make changes if they come to the end of their life and need to be replaced. This can be years. The average lifespan of a building in North America is 79 years.

Another driver that hinders the adoption of energy efficient equipment is that the use of the equipment is often different from the person that needs to purchase it. The purchaser then has an incentive to get the cheapest equipment as that is the only cost they incur. They rarely get a benefit from buying expensive but more efficient equipment.

Because of this waste is tolerated. It is also tolerated because it is difficult to deal with. It requires in-depth knowledge and considerable time to plan and execute energy efficiency reduction measures. Management support is necessary; if absent, these types of projects rarely happen.

## Solutions

There are solutions to this problem. Regulation is one: energy efficiency standards improve the efficiency of stock over time. This has been a strategy pursued by Europe in particular and is also being increasingly adopted in emerging markets like China.

The adoption and investment of smart grids are also promoting better energy use and less transport losses. This also provides information to consumers, which has been a barrier for getting consumers to make better decisions.

There is also being significant work and research in the transport area where new technologies and fuels are increasing efficiency. Most transport vehicles companies are bringing new models to the market, and investments are being made by the public transport industry.

We have been told during the conference that energy efficiency is the single most cost effective way of cutting carbon emissions, but this measure does seem to have some barriers that need to be addressed. Both market drivers and regulatory drivers are needed to get past some of the disincentives in this area.

While this is primarily seen as an issue for the developed world, it impacts the developing world as they seek sustainable means to economic growth. "I was surprised to hear that China was working so hard on improving energy efficiency and implementing standards. That was really good to hear. Very encouraging. The graphic in the China Demand Session showing a line of trucks from Chinese manufacturers to North American Malls was quite clever." – Phaira, delegate from Canada.

