

# EARLY ACTION VITAL TO KEEP TEMPERATURE RISE BELOW 2°C

## Early, concerted and consistent policy action is crucial for a swift energy transition

Deployment of low-carbon technologies and enabling infrastructure to put the global energy system on the path to decarbonisation needs to start today. This must happen not only in the power sector, but also in developing solutions for sectors where no significant or economically attractive solutions yet exist. If action is delayed, technology learning will slow, the risk of locking in wrong trajectories will increase, the likelihood of stranded assets will increase, total investment costs will increase, and costly negative emission technologies will be needed to limit planetary warming.

## Technological learning will slow with delayed action, thereby increasing costs.

Technological learning is key, as seen in the great achievements in solar and wind power generation, leading to increased deployment and substantial cost reductions. These lessons should be applied to other emerging, yet crucial, low-carbon technologies (such as electric vehicles or carbon capture and storage) to accelerate their implementation and facilitate the transition to a low-carbon energy sector in a cost-effective manner. Typically, energy supply and demand technology costs decrease by between 10% and 20% with each doubling of total installed capacity.

With delayed policy action and reduced investment in new capacity, the cost of low-carbon technologies will decline more slowly than under REmap, and a forced last-minute energy transition will therefore increase costs.<sup>1</sup> It is important to clarify long-term objectives at an early stage, as a gradual tightening of objectives can compound stranded assets. The most urgent matter to be clarified in this respect is the role of natural gas as a transition fuel, and also efficient coal plants, which are still seen in some countries as part of a decarbonisation strategy. REmap analysis suggests that this is a high-risk approach.

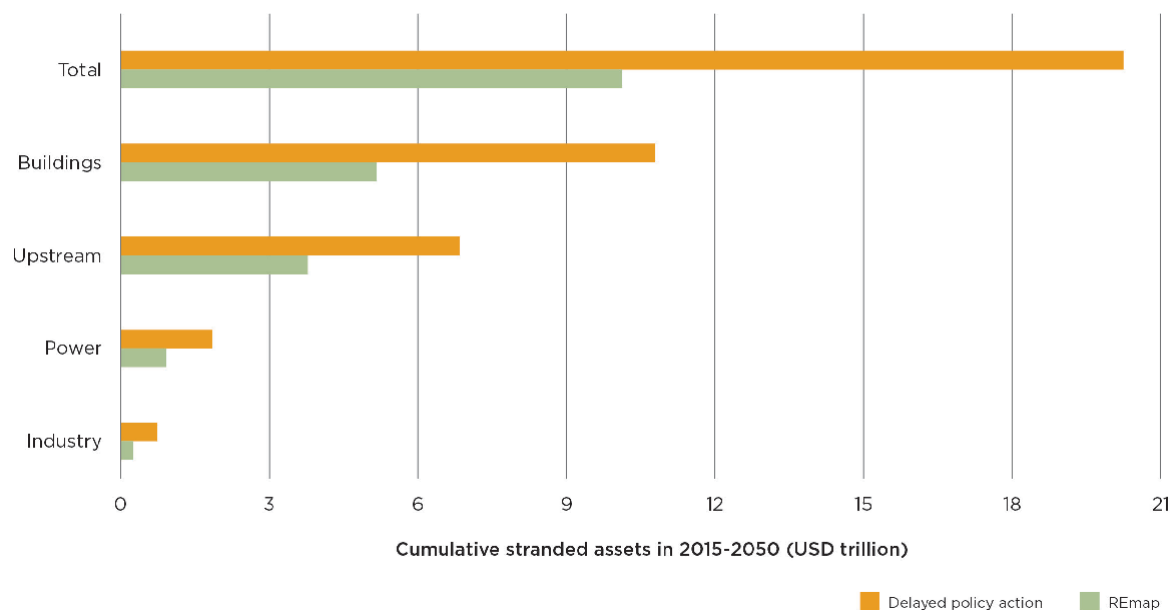
## Early action is critical to minimise the risk of stranded assets.

Delayed action to decarbonise the energy sector would cause significant asset stranding, with the total value of stranded assets in the upstream energy, electricity generation, industry and buildings sectors valued at USD 20 trillion, an increase of USD 10 trillion compared to a scenario where action starts today. To put this in context, USD 10 trillion is approximately 4% of global wealth in 2015 (estimated at USD 250 trillion at current exchange rates).<sup>2</sup> Figure 1 compares asset stranding under delayed policy action and under REmap.

<sup>1</sup>The Reference Case is the most likely case based on current and planned policies and expected market developments. The REmap case is a low-carbon technology pathway that goes beyond the Reference Case for an energy transition to decarbonise the energy system in line with the goal in the Paris Agreement of limiting global temperature rise to less than 2°C above pre-industrial levels with a 66% probability.

<sup>2</sup>Credit Suisse, 2015.

**Figure 1: Expected stranded energy assets by sector, 2015-2050**



**Economic reasons to act now**  
 Delaying policy action will result in an additional USD 10 trillion in stranded assets.

The sector that would see the largest amount of asset stranding globally is buildings. About USD 10 trillion would be stranded under delayed policy action, more than double the amount under REmap.

The second-largest group of stranded assets would be in upstream energy infrastructure, 75% of which would be in oil production. Large capital investments made in upstream infrastructure under delayed policy action would result in USD 7 trillion worth of assets being stranded after 2050.

Electricity generation is the third-largest sector for stranded assets, with USD 1.9 trillion stranded under delayed policy action. For example, the coal power plants now being built in the developing world would have to be stranded after 2030 to meet decarbonisation targets. Stranded assets in industry are estimated at USD 740 billion from 2015 to 2050.

**Delayed action on decarbonisation would imperil global climate agreements and require costly negative emission technologies.**

Delayed action would significantly hinder efforts to limit global temperature rise to well below 2°C, as laid out in the Paris Agreement on climate change. It is likely that costly technologies to remove carbon from the atmosphere (known as negative emission technologies, such as direct air capture, enhanced rock weathering, afforestation, and bioenergy coupled with carbon capture and storage) would be required to inhibit global temperature rise and clean up the unabated energy emissions from prior years. While it is theoretically possible to absorb CO2 from the atmosphere with these technologies, the associated costs would be significant. Given the long lead times for deploying low-carbon technologies, early action will be essential to mitigate the most substantial effects of climate change in an economically feasible manner.