

Diversions instructions

The climate change adaptation board game contains two diversions.

You must **stop** and follow the diversion instructions before you move on. At the diversions, teams are given a scenario and two decision pathways – one pathway is to invest in long-term adaptation actions; this is an expensive option. The other pathway is short-term and designed to deal with current challenges; this decision path is substantially cheaper. The decision pathway selected here will have financial implications as the team moves along the diversion.

Please note that the diversion scenarios are fictional. *The costs attributed to the different options are examples designed to generate discussion and to illustrate the investment decisions you may have to make as a result of extreme weather and climate change.*

The following pages contain a set of cards for each diversion. You should print the cards double-sided and climate facts will be printed on the reverse.

Cut out the cards and place them in envelopes marked Diversion 1A-G and Diversion 2A-G.

Diversion 1

Newsflash November 2015

Due to an intense period of heavy rain there is major flooding throughout the region. Transport routes are significantly disrupted, homes and businesses have suffered considerable damage and a number of people have been injured. There are calls from all sectors to improve the region's resilience to future flooding, particularly in light of the climate change projections for:

- Milder, wetter autumns and winters
- Increased frequency and intensity of extreme rainfall events

It has been recommended that you put in place a Strategic Flooding Plan for the region. This may include some or all of the following:

- Sustainable urban drainage scheme (SUDS)
- Community/business awareness initiative
- Green roofs/green spaces and wetlands
- Water retention ponds and other rainwater storage
- Spatial planning policies
- Surface water management scheme
- Sustainable drainage in new developments
- Flood protection schemes, flood gates and vent guards

Budgets are extremely tight and significant savings must be found in coming years. To include all of these measures would cost an additional **£30 million**.

Your team now has some decisions to make:

Option 1 – You can put in place a plan which provides for an extensive range of actions to cope with and protect against future flooding. If you choose this option pay your banker an additional **£30 million** and throw the dice to move along the diversion.

Option 2 – You can put in place some short-term flood alleviation measures. These will cost you **£10 million**. If you choose this option, please pay your banker **£10 million** and throw the dice to move along the diversion.

Please make your decision now and pay the banker the appropriate sum of money.

Each time you land on a diversion square the banker should hand you the corresponding card to reveal your consequences (which may be positive or negative irrespective of your decision above). **Good luck!**

Diversion 1A

Autumns and winters have become considerably milder but wetter.

Option 1 – Green roofs and other green infrastructure have proven their worth in reducing run-off. **Collect £3 million from your banker.**

Option 2 – The failure to put in place green infrastructure and other measures has resulted in frequent flash flooding throughout the region. **Pay £5 million to your banker.**

Diversion 1B

An unprecedented storm surge has resulted in the River Clyde bursting its banks in several areas throughout the region.

Option 1 – The strategic measures implemented throughout the region have all contributed to reducing the impact of the storm surge, however some areas have still suffered. **Pay £3 million to your banker.**

Option 2 – The damage to the region has been catastrophic. Emergency services are stretched beyond capacity, many businesses are unlikely to recover and lives have been lost. **Pay £30 million to your banker.**

Diversion 1C

Rainfall events have become noticeably more intense and frequent in the region.

Option 1 – the flood awareness programme has more than paid for itself. Community and business groups take coordinated action in preparation for a flood. **Collect £5 million from your banker.**

Option 2 – businesses and communities are still struggling and your reputation suffers significantly when you fail to invest money in a flood awareness programme. **Go back 2 spaces.**

Diversion 1D

Rainfall events have become noticeably more intense and frequent in the region.

Option 1 – the enhancement of spatial planning policy together with the implementation of flood prevention schemes and adoption of SUDS in new developments has proven effective in dealing with these events. **No action required.**

Option 2 – the region continues to be plagued with flood events. You must now invest in a more strategic flooding plan. **Pay £45 million to your banker.**

Diversion 1E

We've been fortunate – so far climate change in Scotland has been at the lower end of the projected range.

Option 1 – Questions are being asked about the extent of climate change adaptation work that was undertaken and its necessity. **Go back 2 spaces.**

Option 2 – the short-term flood alleviation measures are doing the job! **Collect £10 million from your banker.**

Diversion 1F

All is well with the world!

Move on one space 😊

Diversion 1G

Rainfall events have become noticeably more intense and frequent in the region.

Option 1 – Despite the extensive range of adaptation measures adopted, insurance premiums have risen. **Pay your banker £3 million.**

Option 2 – Insurance premiums continue to rise due to the general increase in claims for weather-related damage. For some businesses, insurance is now unaffordable. **Pay your banker £5 million and go back 6 places.**

Diversion 1H

Although this year has not seen any major rainfall events, it has been a turbulent year globally with flooding, droughts and wildfires making the headlines. The price of basic commodities has risen steeply and security of supply has been reduced.

Options 1 & 2 – Businesses and consumers are suffering as a result of global extreme weather events and supply chains which are not resilient. **Pay your banker £3 million.**

FACT

The city of Chicago put a 38,800 square foot green roof on a 12 storey skyscraper in 2000. Twelve years later, that building now saves \$5000 per year on utility bills.

FACT

Coastal flooding causes approximately 17% of flooding impacts experienced in Scotland. SEPA has improved the coastal flood warning service available for the Firth of Forth and Tay areas. 28 new coastal flood warning schemes have been installed, giving approximately 12,000 people better warning. This will reduce damage to homes and businesses, and the associated financial and psychological strain.

FACT

HafenCity in Hamburg lies to the south of the main city flood dike so it is not protected from storm surges. Instead of surrounding HafenCity by dikes, buildings were elevated on 8m plinths to connect HafenCity with the rest of Hamburg. Disaster coordination, evacuation planning and emergency management are critical to flood risk management in the HafenCity, minimising casualties and material damage.

FACT

Flood defences at the White Cart Flood Prevention Scheme held back rising water and helped protect hundreds of homes and businesses in late November 2011. It is estimated that nearly £11 million worth of flood damage would have been inflicted on homes and businesses in the south side of Glasgow without these new defences.

FACT

There are low-cost flood prevention measures that can be taken to reduce the likelihood of flooding occurring in the first place:

- Ensure water is channelled away from buildings.
- Minimise paved, non-permeable surfaces.
- Maintain drains and keep them free of leaves and dirt.

FACT

What *opportunities* will climate change present to you and your organisation? Discuss in groups what these are and how you can exploit them.

FACT

Globally, there was an upward trend in weather-related insured losses between 1980 and 2011. This trend will continue as our climate changes. Added to this, insurance premiums are likely to rise and become harder for people to obtain, including those living in high flood risk zones. Adapting early is likely to give insurers confidence and increase the likelihood of obtaining affordable insurance in years to come.

FACT

US drought affecting global food prices: America is the world's largest producer of corn, dominating the market. Corn is connected to many food items expanding the impact of those price rises. That means the effects of the drought will reach far beyond the mid-western states baking under extreme temperatures. Robert Thompson, a food security expert at the Chicago Council of Global Affairs said: "What happens to the US supply has an immense impact around the world. If the price of corn rises high enough, it also pulls up the price of wheat".

Diversion 1I

The region is generally experiencing warmer temperatures across all seasons.

Option 1: The green roofs and walls implemented to help manage flood risk have had the added benefit of helping keep buildings cool during warmer summers reducing the need for air conditioning. **Collect £3million from your bank, which has been saved as a result of avoided energy costs.**

Option 2: Buildings across the region are starting to require air conditioning in the summer months resulting in increased carbon emissions and bills.

Pay your banker £3million and go back 1 place.

Diversion 1J

Communities are still suffering as a result of the major flooding that affected the region in 2014.

Option 1: Despite significant investments in flood prevention measures, authorities underestimated the time and money needed to help communities recover. Residents have been living in damp housing for long periods with physical and mental health consequences. **Pay your banker £3million to cover health service costs.**

Option 2: Communities that had already been affected by the floods have repeatedly suffered. Those who could afford it have moved out away leaving communities depressed and run down. Flood prevention works need to be put in place if these communities are to recover. **Pay your banker £40million to implement flood prevention works.**

Diversion 1K

Alongside normal seasonal rainfall the region is affected by three prolonged and very intense spells of rainfall over a six month period.

Option 1: Investment in adaptation measures is paying off. Despite intense rainfall events only slight localised surface water flooding has occurred with minimal impacts. The region is building a reputation as being 'climate ready' and is well placed to attract inward investment. **Collect £60 million from your banker.**

Option 2: The headquarters of an international company has been repeatedly affected by flooding. The company has lost confidence in regional authorities' ability to manage flood risk and is relocating resulting in the loss of 400 local jobs and reputational damage for the region.

Pay your banker £60 million.

Diversion 1L

Community groups campaigning for action to reduce flood risk continue to be active across the region.

Option 1: These community groups were able to inform flood prevention works and develop local projects to build resilience within their communities. This has resulted in increased positive involvement and volunteering in community-based activities. **Move ahead 2 spaces.**

Option 2: The community groups feel let down by decision makers resulting in a lack of trust and unwillingness to work with authorities in the future. **Move back 2 spaces.**

FACT

Since planting a green roof on the Con Edison Learning Centre in Queens, New York the building managers have reduced summer heat gain by 84 per cent.

FACT

Researchers described how the trauma of the floods that hit Carlisle, England in 2005 remained with residents nearly a year and a half later. Their study found that the most stressful phase was spending months drying out and renovating their homes - a situation made worse by problems with insurers, builders and decorators.

FACT

Copenhagen experienced heavy rainfall during a violent thunderstorm on 2nd July 2011. The rain caused flooding throughout the city, including the north-eastern area where the World Health Organisation is located. As a result of flooding, the power supply, telephone and e-mail services were disrupted. Experts assessed building safety while staff worked from home.

FACT

Local residents in Moffat, Scottish Borders, were affected by flooding and concerned enough to form a local Community Flood Resilience Group with the support of the Scottish Flood Forum. Residents "adopted" a drain. This involves taking a pro-active role, checking and monitoring, and notifying the council if a drain needs to be unblocked. They also mapped ownership of the local riverbank, and identify decaying or at-risk trees and report them to the owner. A comprehensive drainage map of Moffat was also produced to help residents understand why flooding occurs in the area.