

Monitoring and evaluating the National Adaptation Programme

Business theme:

- Business impacts from extreme weather
- Supply chain interruptions
- Water demand by industry
- Business opportunities from climate change

Last updated: 30 June 2015

- This slidepack:
 - Serves as a technical annex to **Chapter 7: Business** in the ASC's first statutory report to Parliament on the National Adaptation Programme, available at www.theccc.org.uk/publications
 - Provides the latest trend information on indicators of exposure, vulnerability, action and realised impacts that informed the ASC's assessment. A full list of indicators used by the ASC across all six NAP themes is available at www.theccc.org.uk/publications
 - Will be updated periodically as new data becomes available.
 - Highlights indicators that would be useful but where the necessary datasets have not yet been identified.
 - Follows the structure of the business chapter in the ASC's progress report, which is based on the 'adaptation priorities' the ASC identified for businesses.
- After presenting a high level summary of the ASC's assessment of progress against each of the adaptation priorities, this annex sets out the underlying data by adaptation priority.

Business theme: overview

Adaptation priority	Is there a plan?	Are actions taking place?	Is progress being made?
1. Business impacts from extreme weather	Green	Green	Amber
2. Supply chain interruptions	Amber	Amber	Amber
3. Water demand by industry	Amber	Green	Green
4. Business opportunities from climate change	Green	Green	Amber

- Red:** plans and policies, delivery of actions, or progress in addressing vulnerabilities, are lacking.
- Amber:** adaptation priority has been partially addressed, some evidence of progress in some areas.
- Green:** plans are in place, actions are being delivered, progress is being made.
- Grey:** insufficient evidence to form a judgement.

1. Business impacts from extreme weather

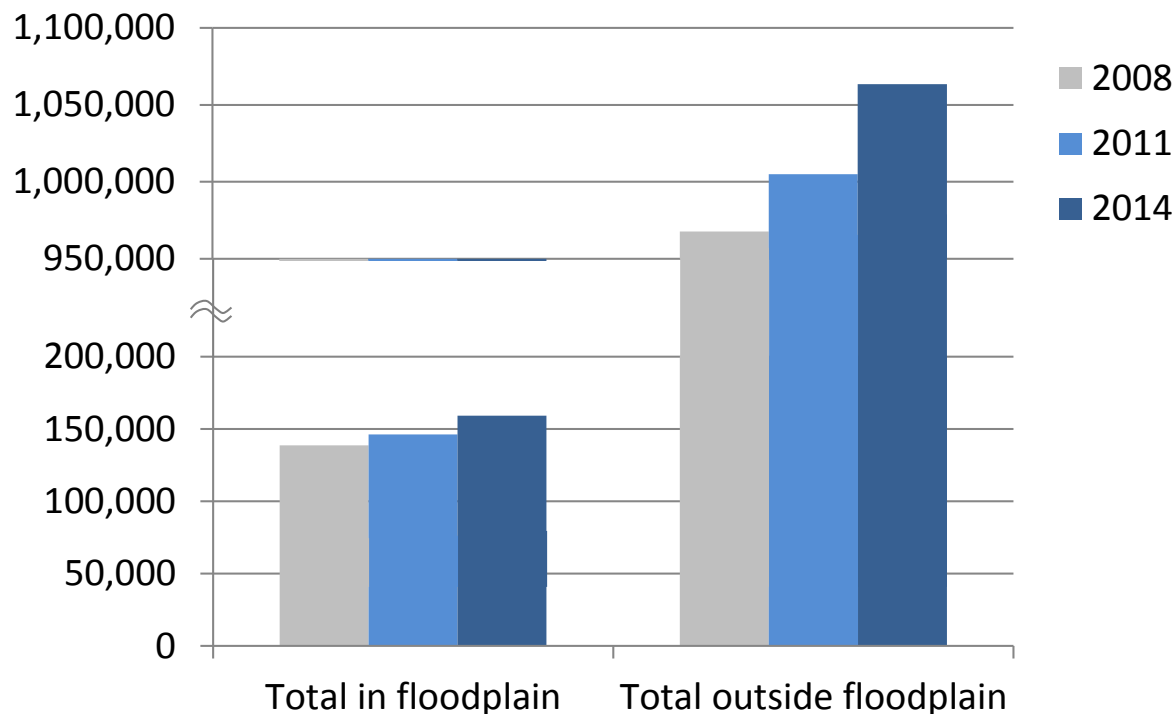
Measure	Data series	Source	Trend	Implication
Number of non-residential properties at risk of flooding	2008, 2011 and 2014	OS Mastermap and NaFRA	↑	Likely to lead to a greater number of commercial properties being flooded and a rise in damages and disruption
Rate of development of non-residential properties in areas at risk of flooding	2008-10 and 2011-14	OS Mastermap and NaFRA	↑	Likely to lead to a greater number of commercial properties being flooded and a rise in damages and disruption
Proportion of businesses with business continuity plans in place	2008 to 2013	Cabinet Office	↑	Businesses with business continuity plans that cover flooding will be able to respond and recover more quickly when a flood occurs
Uptake of flood warnings	2007 to 2012	Environment Agency	↔	The levelling-off in uptake of flood warnings indicates many businesses are unaware of the risk of flooding in their area
Area of permeable paving installed in commercial projects	2009 to 2013	Jenco and Climate Resilience Ltd (2014) for ASC	↑	Slow rate of growth suggests commercial properties remain susceptible to surface water flooding
Weather related business insurance claims	Quarterly since 1989	ABI	↔	

1. Business impacts from extreme weather

Number of non-residential properties at risk of flooding



Likely to lead to a greater number of commercial properties being flooded and a rise in damages and disruption



- There were 142,000 non-residential properties located in the floodplain in 2008. This increased to 166,000 in 2014
- Around 14% of non-residential properties are located in the floodplain

Source: HR Wallingford (2015) for the ASC.

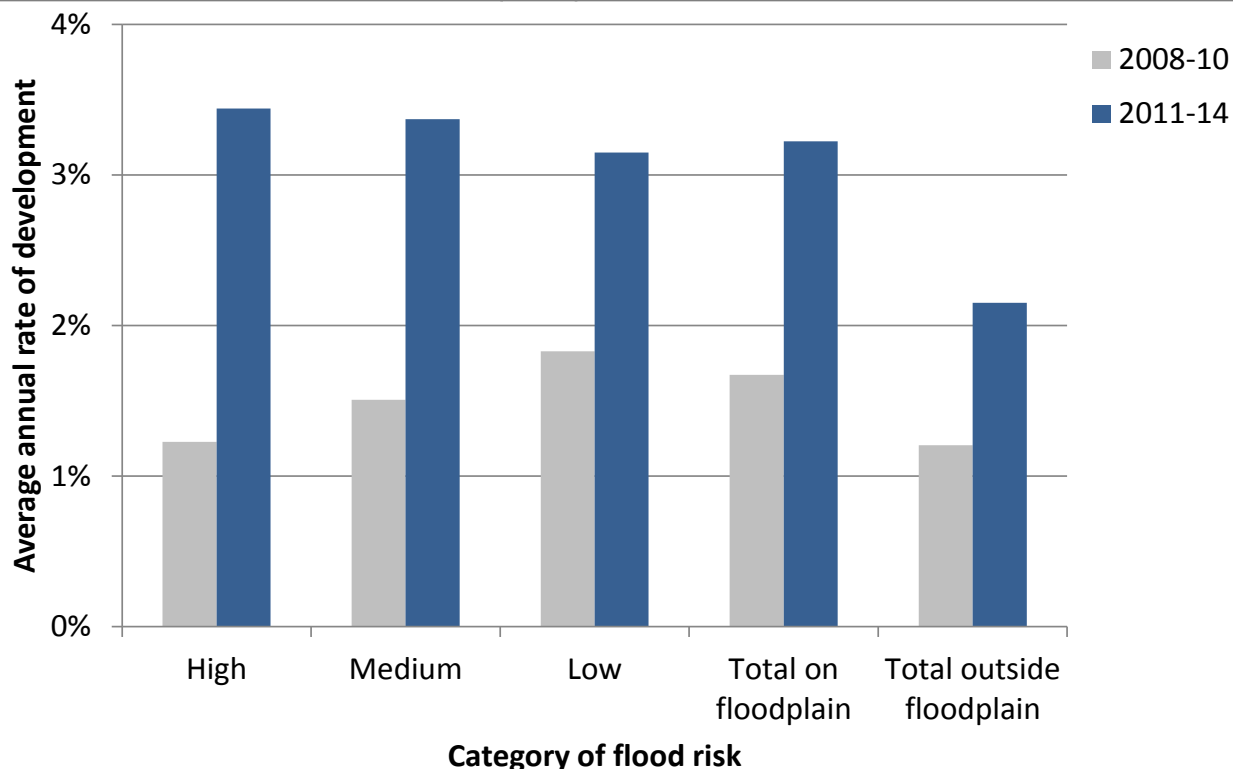
Notes: GIS mapping was used to identify the number of properties in three time periods (2008, 2011 and 2014) in high, medium and low flood risk categories, accounting for the presence and condition of flood defences in 2014. This provides a slightly conservative estimate because, for example, a property built in a significant risk area that was subsequently protected by a defence and moved into the moderate risk category would be recorded as being built in a moderate risk area. These areas are identified by the Environment Agency's National Flood Risk Assessment (NaFRA) dataset.

1. Business impacts from extreme weather

Rate of development of non-residential properties in areas at risk of flooding



Likely to lead to a greater number of commercial properties being flooded and a rise in damages and disruption



Source: HR Wallingford (2015) for the ASC.

Notes: GIS mapping was used to identify the number of properties in three time periods (2008, 2011 and 2014) in high, medium and low flood risk categories, accounting for the presence and condition of flood defences in 2014. This provides a slightly conservative estimate because, for example, a property built in a significant risk area that was subsequently protected by a defence and moved into the moderate risk category would be recorded as being built in a moderate risk area. These areas are identified by the Environment Agency's National Flood Risk Assessment (NaFRA) dataset.

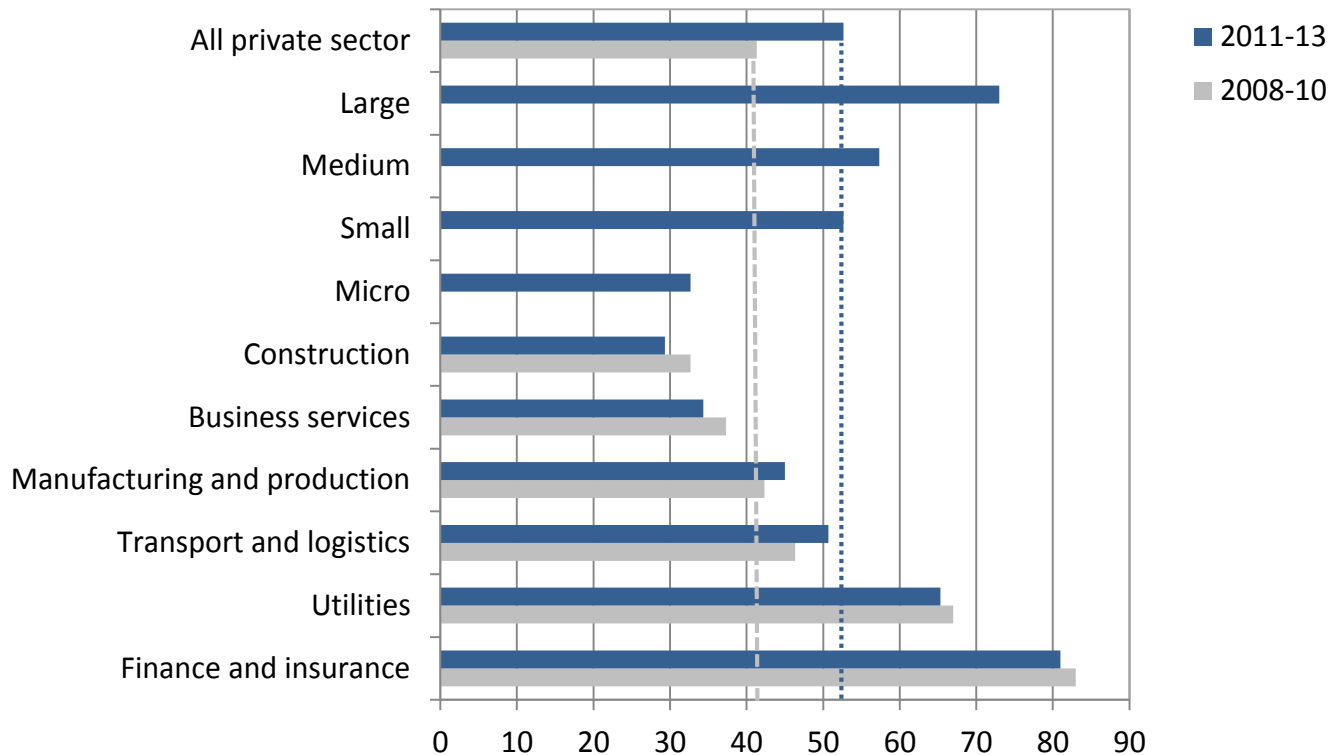
- ☪ The annual rate of non-residential development increased between 2008-10 and 2011-14
- ☪ The rate of development has been higher in the floodplain than outside of the floodplain, and between 2011 and 2014 the annual rate of development was the highest in areas at a high likelihood of flooding

1. Business impacts from extreme weather

Proportion of businesses with business continuity plans in place (%)



Businesses with business continuity plans that cover flooding will be able to respond and recover more quickly when a flood occurs.



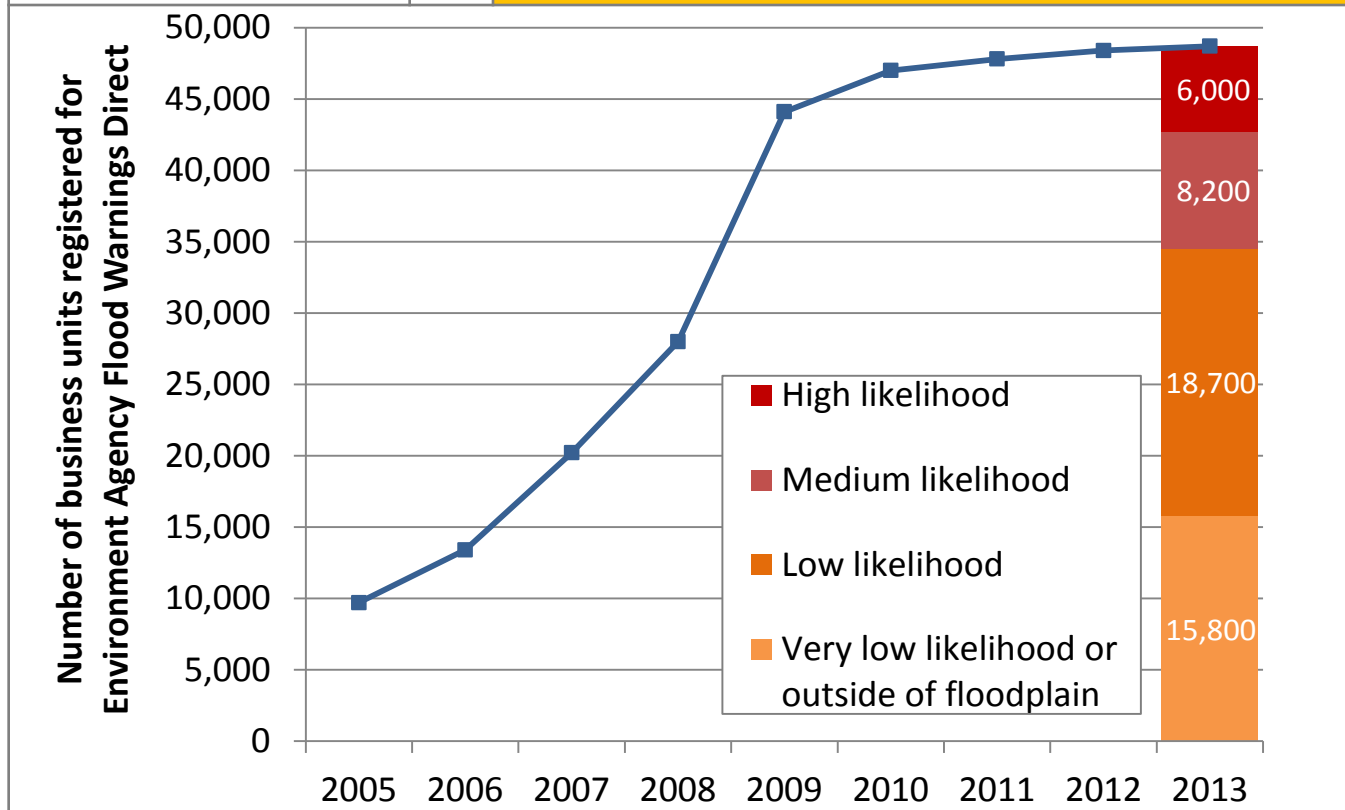
- C The proportion of businesses with business continuity plans has increased from 41% in 2008-10 to 53% in 2011-13
- C Uptake is highest amongst larger companies and finance, insurance and regulated sectors. It is lowest amongst businesses in the construction sector
- C Four-fifths of businesses that have implemented business continuity plans report the benefits exceed the costs, suggesting further increases in uptake may be beneficial

Source: Chartered Management Institute (2013) *Weathering the storm: The 2013 business continuity management survey*.

Notes: Results are based on responses to a survey of CMI members. The survey sample varies from year-to-year. In 2013 637 responses were received. Due to year-to-year variation, results for each year of the survey have been averaged over a three year period.

1. Business impacts from extreme weather

Uptake of flood warnings ↔ **Levelling-off of flood warnings indicates many businesses at risk of flooding are not aware of the risk**



- Net registrations (registrants less cancellations) for the Flood Warnings Direct scheme increased from 2005 to 2009 but have levelled off since
- Only one-fifth (6,000 of 28,500) of business units at high likelihood of flooding have registered for the scheme
- The number of businesses at high likelihood of flooding that receive flood warnings is expected to be higher as a result of the 'opt out' service provided by the Environment Agency. However, the Environment Agency is unable to tell whether telephone numbers they hold as a result of the Extended Direct Warnings service belong to households, businesses or other organisations

Source: HR Wallingford (2014) for the ASC.

Notes: Address level data on registrants of the EA Flood Warnings Direct scheme were overlaid onto the National Flood Risk Assessment (NaFRA) and ONS business data. This enabled the number of businesses actively registered for the flood warnings service to be calculated for each flood likelihood level. The figures reported are for businesses located in England only.

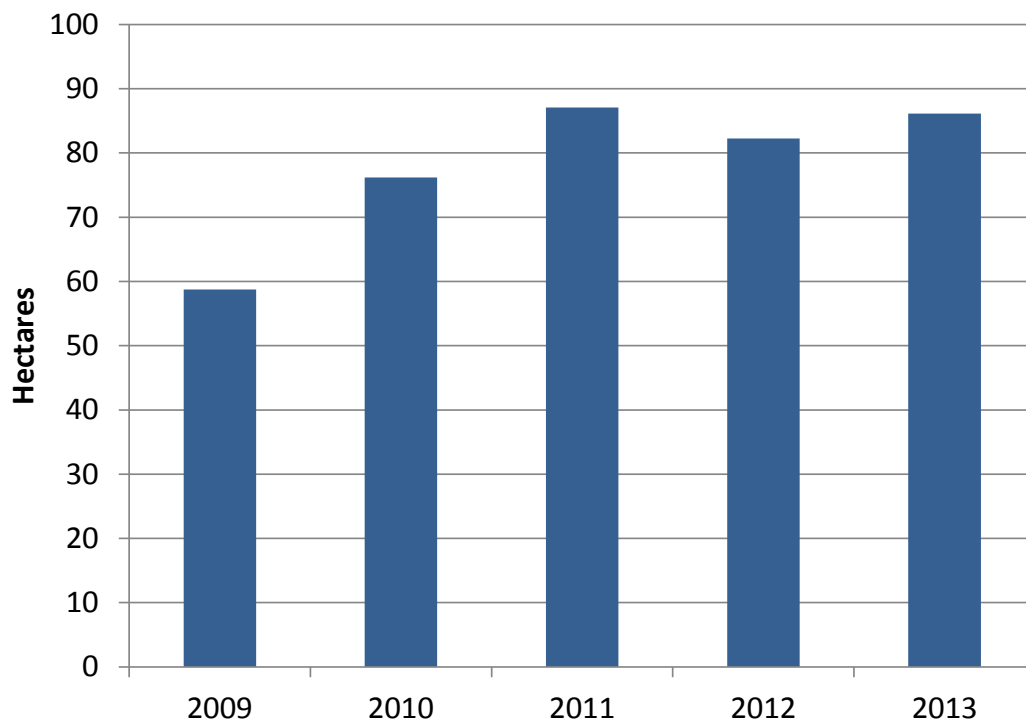
1. Business impacts from extreme weather

Area of permeable paving installed in commercial projects



Low uptake will mean commercial properties will be more susceptible to surface water flooding

- ☾ The area of permeable paving installed in commercial projects increased on average at a rate of 10% per year between 2009 and 2013
- ☾ However, in 2013, permeable paving accounted for only 14% of all block paving sales to commercial projects

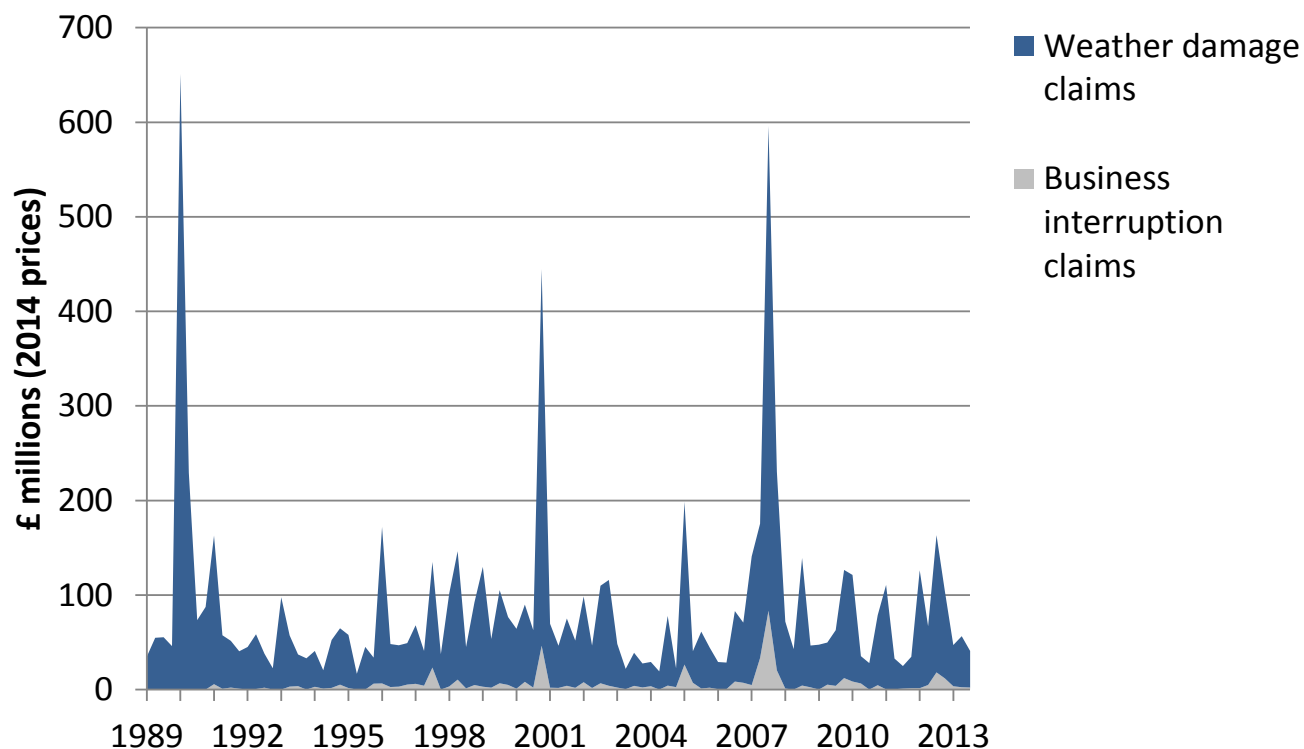


Source: Jenco and Climate Resilience Limited (2014) for the ASC.

Notes: Block paving manufacture and sales in the UK is dominated by six national companies, all of which are members of the trade association Interpave. In addition, there are some regional manufacturers and suppliers, at least one of which is an importer from Eire. A confidential data request was made to these companies seeking data on sales of concrete block paving and concrete block permeable paving between 2004-2013, with a particular focus on identifying trends in the domestic and commercial markets. Responses were received from all the companies contacted, although data covering a ten year period was only available from two companies. The 2009-2013 totals are based on data received from over 90% of England's manufacturers and suppliers.

1. Business impacts from extreme weather

Weather related
business insurance
claims



- Weather damage insurance claims by business customers averaged £81 million a quarter between 1989 and 2012 (in 2014 prices)
- Business interruption claims by business customers averaged £5 million a quarter over the same period (in 2014 prices)
- Insurance claims peaked in 1990, 2000 and 2007 following major storms and flooding

Source: ABI (2014) *Unpublished*.

Notes: Figures shown are quarterly insurance claims by business customers reported by ABI members. These have been converted into 2014 prices using the HMT GDP deflator (as of March 2015).

2. Supply chain interruptions

Measure	Data series	Source	Trend	Implication
There are currently no indicators for this adaptation priority that are collected on a consistent basis over a sufficient period of time. The ASC's assessment of progress in this area has been based on a series of evidence from academic literature, research reports, case studies and data collected through surveys.				

3. Water demand by industry

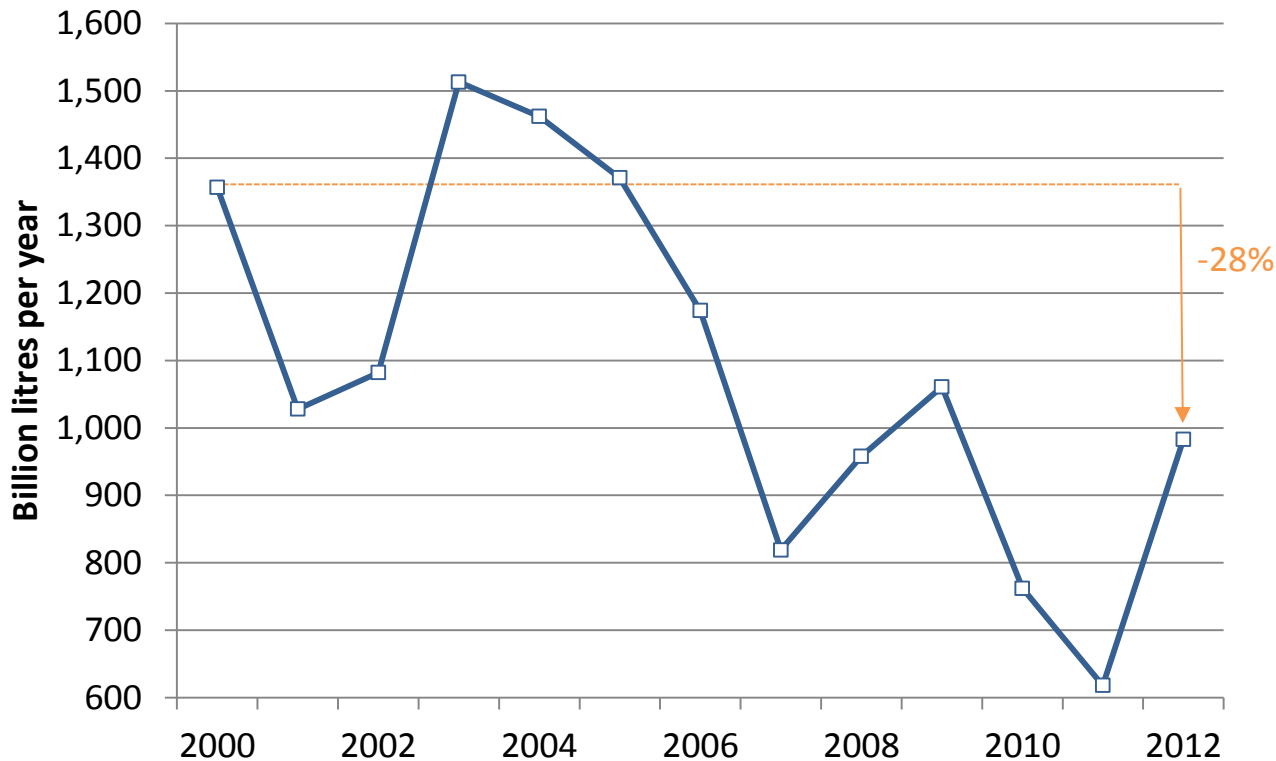
Measure	Data series	Source	Trend	Implication
Water abstraction by industry from freshwater sources	2000 to 2012	Defra ABSTAT	↓	Reduces likelihood of supply deficits and impacts on businesses
Non-household use of public water supply	2000 to 2013	Ofwat	↓	Reduces likelihood of supply deficits and impacts on businesses
Water use and intensity at food and drink manufacturing sites	2007, 2012 and 2013	WRAP	↓	Reduces likelihood of supply deficits and impacts on food and drink manufacturing sites
Proportion of non-household users of public water supply with water meters	2000 to 2013	EA	↑	Ensures non-household properties face a price per unit of water they consume, encouraging water efficient behaviour

3. Water demand by industry

Water abstraction by industry from freshwater sources



Reduces likelihood of supply deficits and impacts on businesses



Source: HM Government (2014) *Abstraction Statistics*.

Notes: The figures above are for direct abstraction from freshwater sources by 'other industry' in England. This captures abstractions by all private sector organisations with an abstraction licence, except those by the agriculture sector, water companies and for electricity generation.

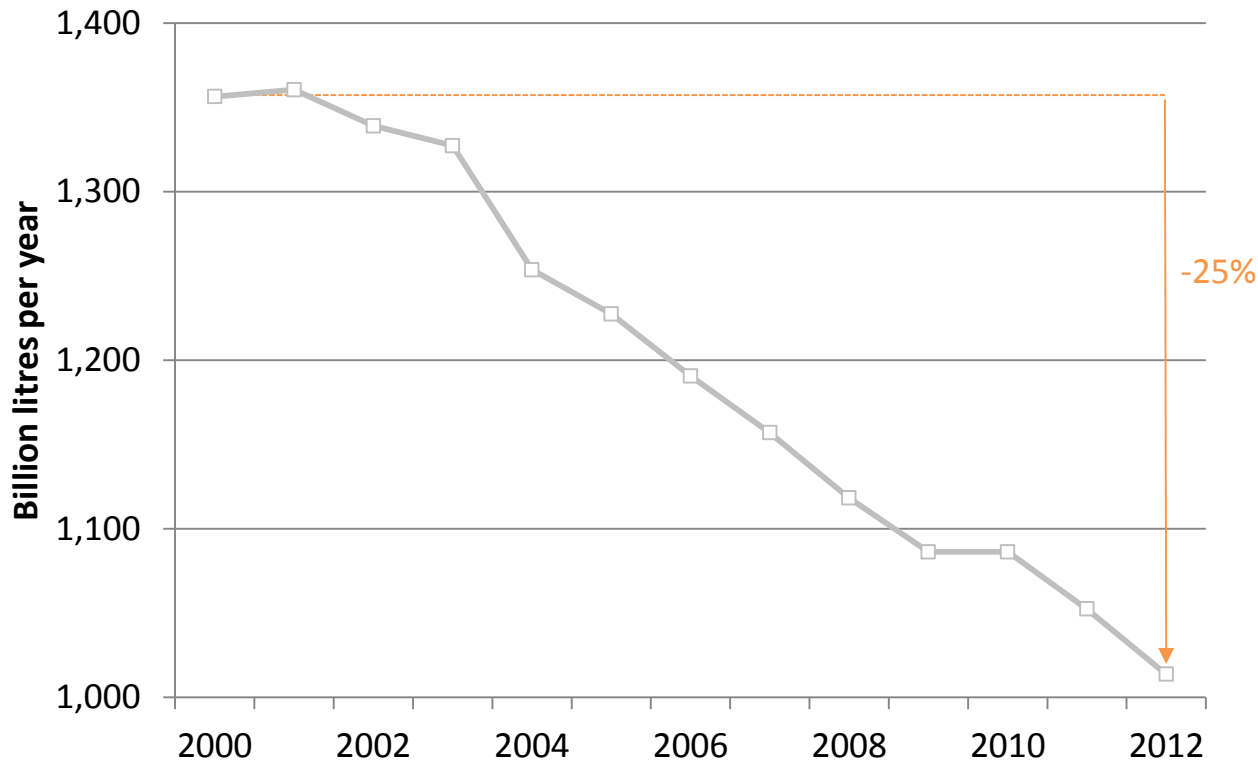
- Abstraction by industry accounts for around one-tenth of all abstraction from freshwater sources
- Since 2000 the volume of water abstracted by industry has fallen by a quarter, with large year-to-year variations
- Analysis by the ASC suggests around two-thirds of the fall in water abstraction since 2005-07 could be attributed to improvements in water efficiency at sites, with the remaining third being the result of the decline in production of large water using industries. This is similar to the trend observed in food and drink manufacturing sites under the Federation House Commitment (see later slide)

3. Water demand by industry

Non-household use of public water supply



Reduces likelihood of supply deficits and impacts on businesses



Source: Environment Agency (Unpublished) *June return historic data*.

Notes: England only.

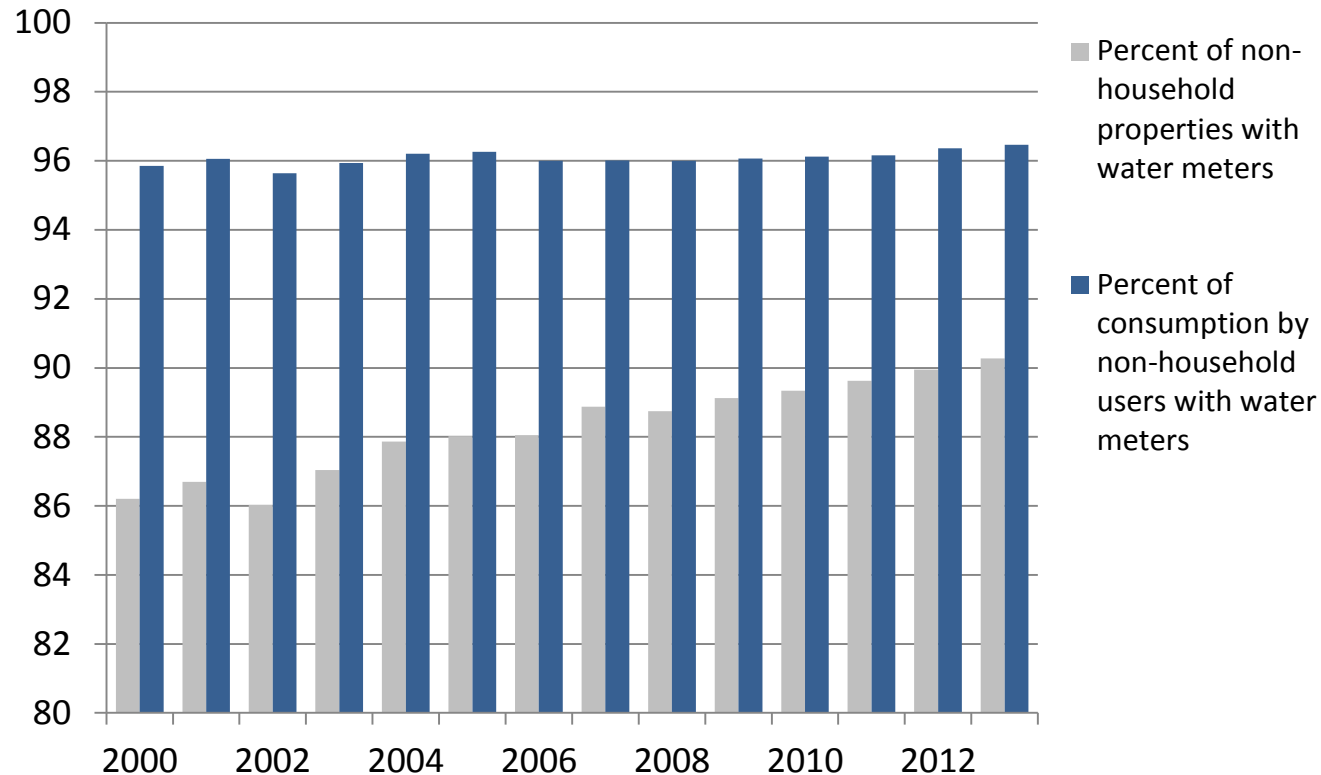
- In 2012 non-household customers consumed one-quarter of the total public water supply
- Since 2000 consumption of public water supply by non-household customers has fallen by around one-quarter

3. Water demand by industry

Percent of non-household users of public water supply with water meters



Ensures non-household properties face a price per unit of water they consume, encouraging water efficient behaviour



- The proportion of non-household properties with water meters has increased from 86% in 2000 to 90% in 2013
- Nearly all (96%) of non-household consumption of public water supply is by users that have a water meter

Source: Environment Agency (Unpublished) *June Returns data*.

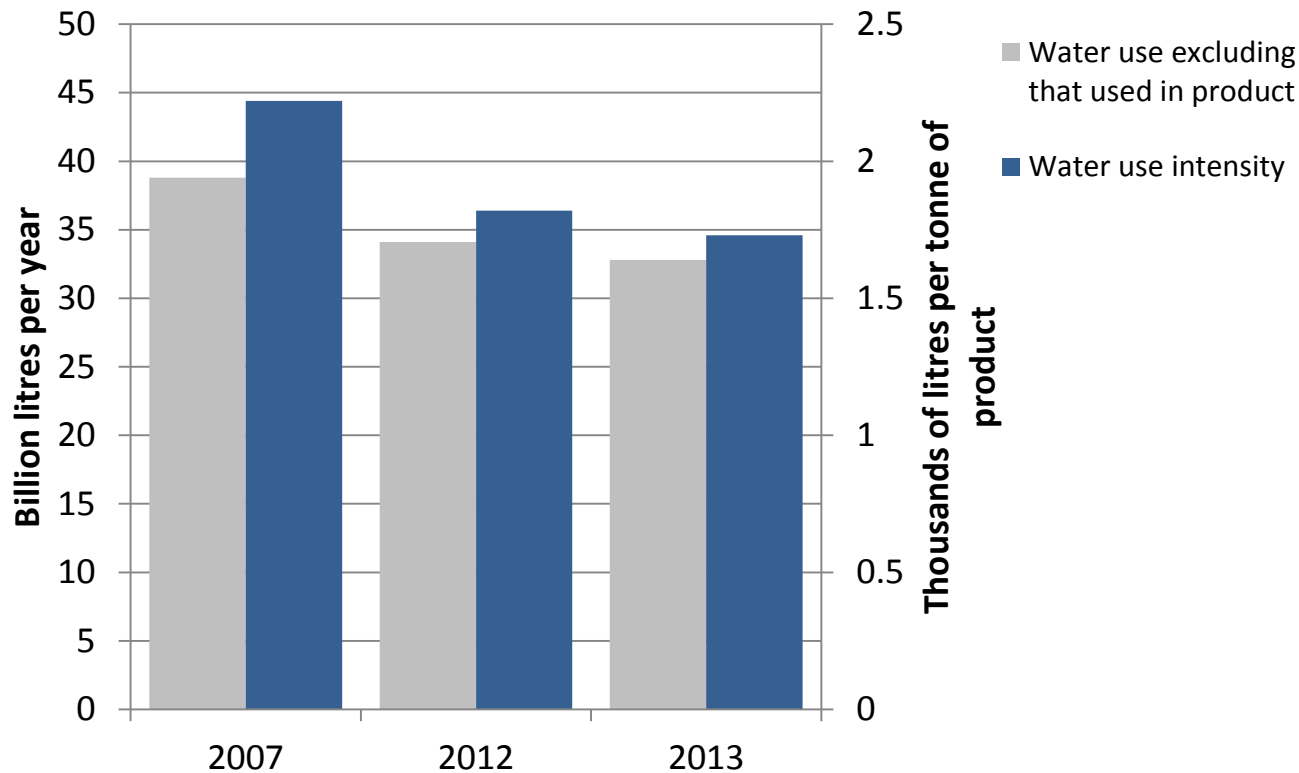
Notes: England only.

3. Water demand by industry

Water use and intensity at food and drink manufacturing sites



Reduces likelihood of supply deficits and impacts on food and drink manufacturing sites



Source: WRAP (2014) *The Federation House Commitment Progress Report 2014*.

Notes: Figures are based on data provided by 254 of the 284 sites that are signatories to the FHC. Collectively, these account for around one-quarter of water used by all food and drink manufacturing sites in the UK. Water use (excluding that in product) is reported because this is the amount of water that can be reduced by implementing best practice on site, excluding changes in product.

- The Federation House Commitment (FHC) is a voluntary scheme developed to help food and drink manufacturers reduce water use at their sites to help achieve a water reduction target of 20% by 2020 against a 2007 baseline. This target was recommended by the Food Industry Sustainability Strategy
- Water use excluding that used in product at FHC sites fell by 16% between 2007 and 2013
- Water intensity, measured in terms of m³ per tonne of product, fell by 22% over the same period. The larger reduction in water intensity relative to total water use reflects the increase in the level of production (in tonnes) over the period

4. Businesses opportunities from climate change

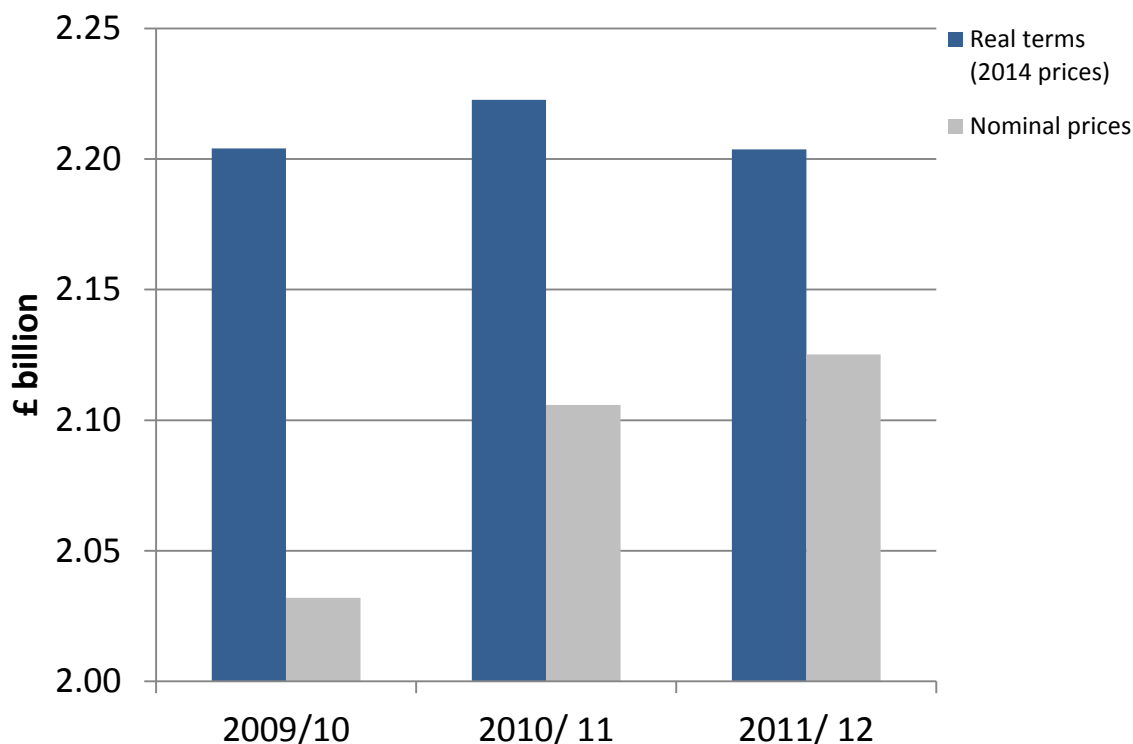
Measure	Data series	Source	Trend	Implication
Sales of adaptation goods and services	2009/10 to 2011/12	K-Matrix for Defra	↔	Shows businesses may not be taking full advantage of increased demand for adaptation goods and services
Patents registered by UK companies for water-related adaptation measures	1990 to 2010	Grantham Institute at LSE	↑	Indicates increased capacity of businesses to develop ideas which could be converted into commercial opportunities

4. Business opportunities from climate change

Sales of adaptation goods and services



Shows businesses may not be taking full advantage of increased demand for adaptation goods and services



Source: K-Matrix (2013) for BIS and Defra *Adaptation and resilience (climate change) report for 2011/12*.

Notes: Sales of adaptation goods and services have been estimated through market research by K-Matrix. The sales figures presented relate to activity that can be directly attributed to increasing resilience to a changing climate. K-Matrix have also estimated the size of the broader 'resilience' market, which is much larger than the figures presented here. Sales have been converted into 2014 prices using the HMT GDP deflator (as of March 2015).

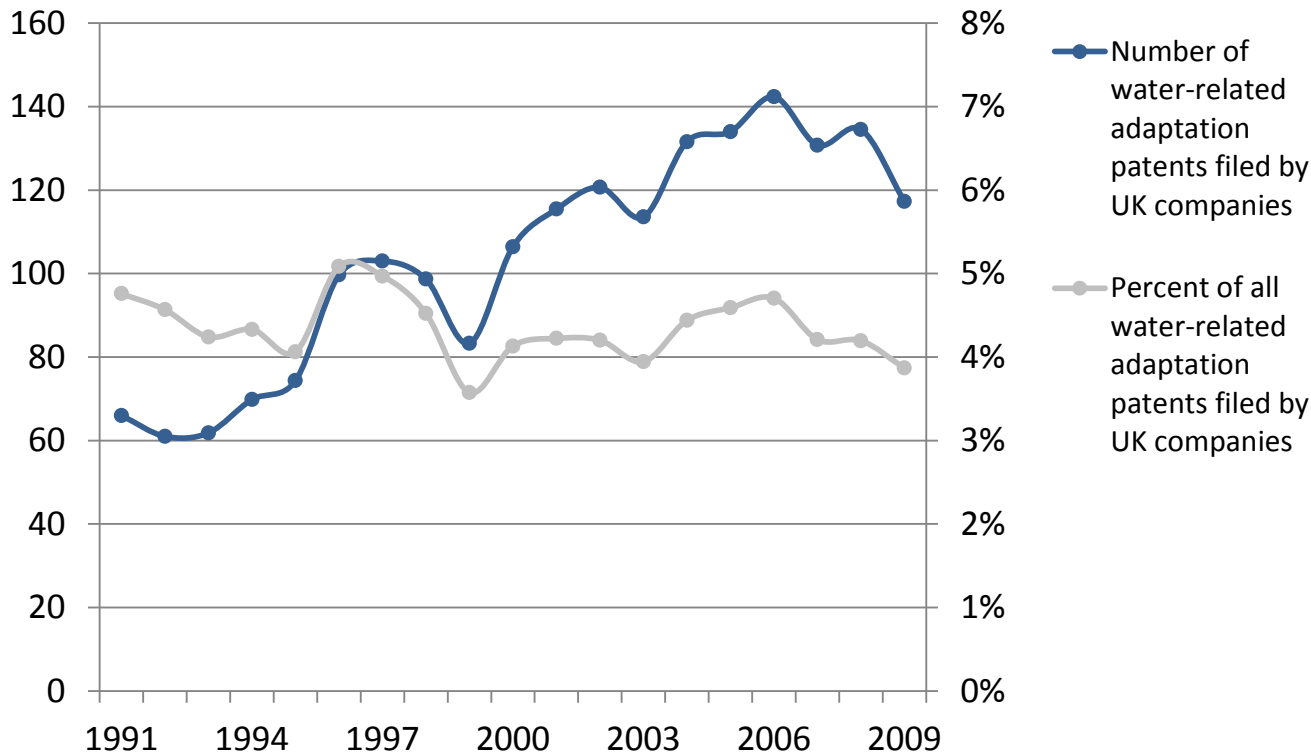
- Sales of adaptation goods and services grew by 2.6% per annum between 2009/10 and 2011/12. However, in real terms they remained constant over the short period of time data are available
- The Greater London Authority will soon be publishing a report with updated figures taking into account a wider variety of adaptation goods and services

4. Businesses opportunities from climate change

Patents registered by UK companies for water-related adaptation measures



Indicates increased capacity of businesses to develop ideas which could be converted into commercial opportunities



- Patent activity provides an indication of the capacity of the UK to develop ideas which could in turn be converted into commercial opportunities
- The number of water-related adaptation patents registered by UK companies in the UK and globally nearly doubled between 1990 and 2009
- The share of all water-related adaptation patents registered by UK companies has remained fairly constant over the past decade

Source: Grantham Research Institute at the London School of Economics (Unpublished) *Invention and international diffusion of water: Conservation and availability technologies: evidence from patent data.*

Notes: Water-related adaptation technologies include supply-side (e.g. storage and desalination) and demand-side (e.g. water efficiency and greywater use, crop irrigation improvements such as control of watering and drought-resistant crops, and reducing leakage from pipes) technologies to conserve water. The PATSTAT database was used for the analysis. The figures have been averaged over three years to remove year-to-year variability in patent registrations.

Adaptation Sub-Committee

<http://www.theccc.org.uk>



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