

- Only a few licences for electricity generation have Hands off flow restrictions⁷. If these restrictions were applied to those power stations across different catchments and all triggered at the same time, this could have an impact on the sector's ability to meet electricity demand.
- Water resources are currently under pressure. Already a quarter of water bodies in England and 7% of water bodies in Wales will provide a reliable source of water for new consumptive abstraction for less than 30% of the time⁸.
- Less than 5% of generation in England and Wales in 2011 was generated by thermal plant supported by rivers where there is insufficient water for the environment and abstraction.
- These pressures are likely to increase as a result of climate change, population growth and increased demand for water.

Future shape of the electricity generation sector

- There are a number of factors that will, or have the potential to, affect the characteristics of the electricity sector over the coming years:
 - Electricity Market Reform (EMR)⁹ - will deliver greener energy and reliable supplies that the country needs, at the lowest possible cost. It will transform the UK electricity sector to enable low-carbon generation to compete with conventional, fossil fuel generation.
 - The Industrial Emissions Directive (IED)¹⁰ - streamlines a number of Directives (including the Large Combustion Plant Directive), and will implement new stricter requirements on the emissions from fossil-fuel power stations. Some of our existing power stations will need to close by 2016 and possibly others by 2023.
 - Abstraction Reform - Our abstraction licensing system was designed more than 50 years ago for a world with less environmental protection, with less demand for water and without climate change. It is not suitable to meet the challenges of the future. We are supporting the Department for Environment, Food and Rural Affairs (Defra) with the reform of the current system and the electricity generation sector are advising on the development and assessment of options for reform.
- In addition the Department of Energy and Climate Change (DECC) have set ambitious UK targets for reducing greenhouse gas emissions. This may mean that Carbon Capture and Storage (CCS) technology is fitted to fossil fuel power stations and this could increase their water use by 44-140%¹¹. Depending where these CCS plant are located this could put additional pressure on water resources.
- The use of unconventional gas such as shale gas and coal bed methane is being explored in the UK. Extracting these gases requires water but the volume is small compared with other water users. However, the issue is around the availability of water at the relevant location.
- Together with Defra, DECC and the electricity generation sector, we have modelled the electricity sector's future water demand¹². The results show a very uncertain future for water demand but demonstrate an overall trend of increasing total demand. Projections for future freshwater demand are more variable and could increase or decrease depending on the future electricity generation mix (including the uptake of CCS), future location and the cooling technology used.
- We have explored the availability and reliability of water now and in the future, based on different climate change, environmental and socio economic scenarios. Our analysis¹³ includes water demand projections for different sectors and is available here - <https://brand.environment-agency.gov.uk/mb/5OHfl>

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7 A specified river flow or level at which abstraction must stop to protect the environment and other abstractors' access to water

8 The case for change – current and future water availability, Environment Agency, December 2011, <http://publications.environment-agency.gov.uk/pdf/GEHO1111BVEP-E-E.pdf>

9 <https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform>

10 <http://www.environment-agency.gov.uk/business/145770.aspx>

11 Water demand for Carbon Capture and Storage (CCS), Parsons Brinkerhoff, November 2012 - available on request by emailing aidan.whitfield@environment-agency.gov.uk

12 Forecasting future water demand of the electricity generation sector, report available soon

13 Current and future water availability - addendum. A refresh of the Case for Change analysis, Environment Agency, December 2013 - <https://brand.environment-agency.gov.uk/mb/5OHfl>