Case for change and water demand by the energy sector

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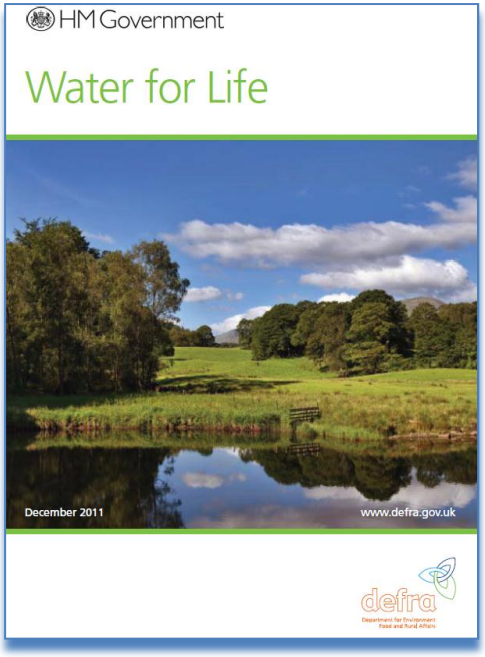
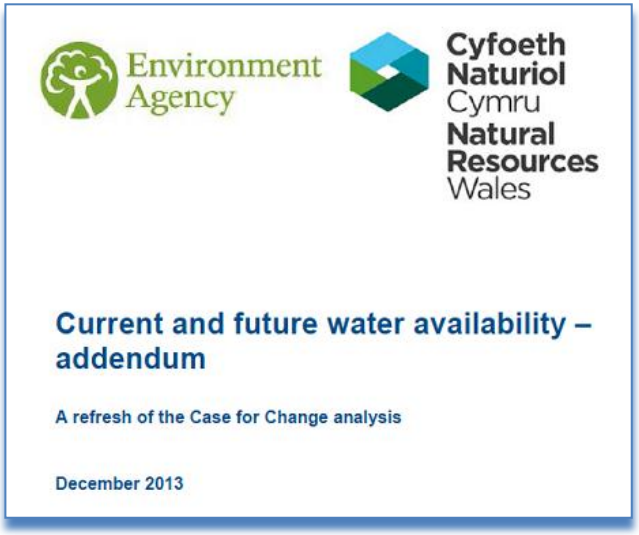
Why develop the Case for Change?





- Already 25% of water bodies in England only have water available for further abstraction 30% of the time.
- Future water availability and reliability is under threat from increasing pressures - climate change, population growth and lifestyle changes, increasing demand.
- Uncertainty is one of the biggest issues we have to consider in planning future access to water
- The Case for Change analysis quantifies the impacts of these future pressures and provides the evidence against which future water policy reform can be tested.

What is the Case for Change about?

- **Case for Change (2011): Current & future water availability**
  - Evidence for government's Water White Paper
  - Explored availability of water now and in the future
  - Based on different climate change, environmental protection and socio-economic scenarios.
  - Water demand projections for different business sectors & domestic use
- **Case for Change Refresh (2013)**
  - Evidence for Government's Abstraction Reform consultation
  - Refreshed demand projections
  - New projections for electricity sector
- **Current & future electricity generation in freshwater catchments (2014)**
  - Further interpretation of Case for Change
  - Focused on freshwater catchments with thermal electricity generation
  - Looked at potential future ability to provide sufficient water for the environment and abstraction at a catchment level

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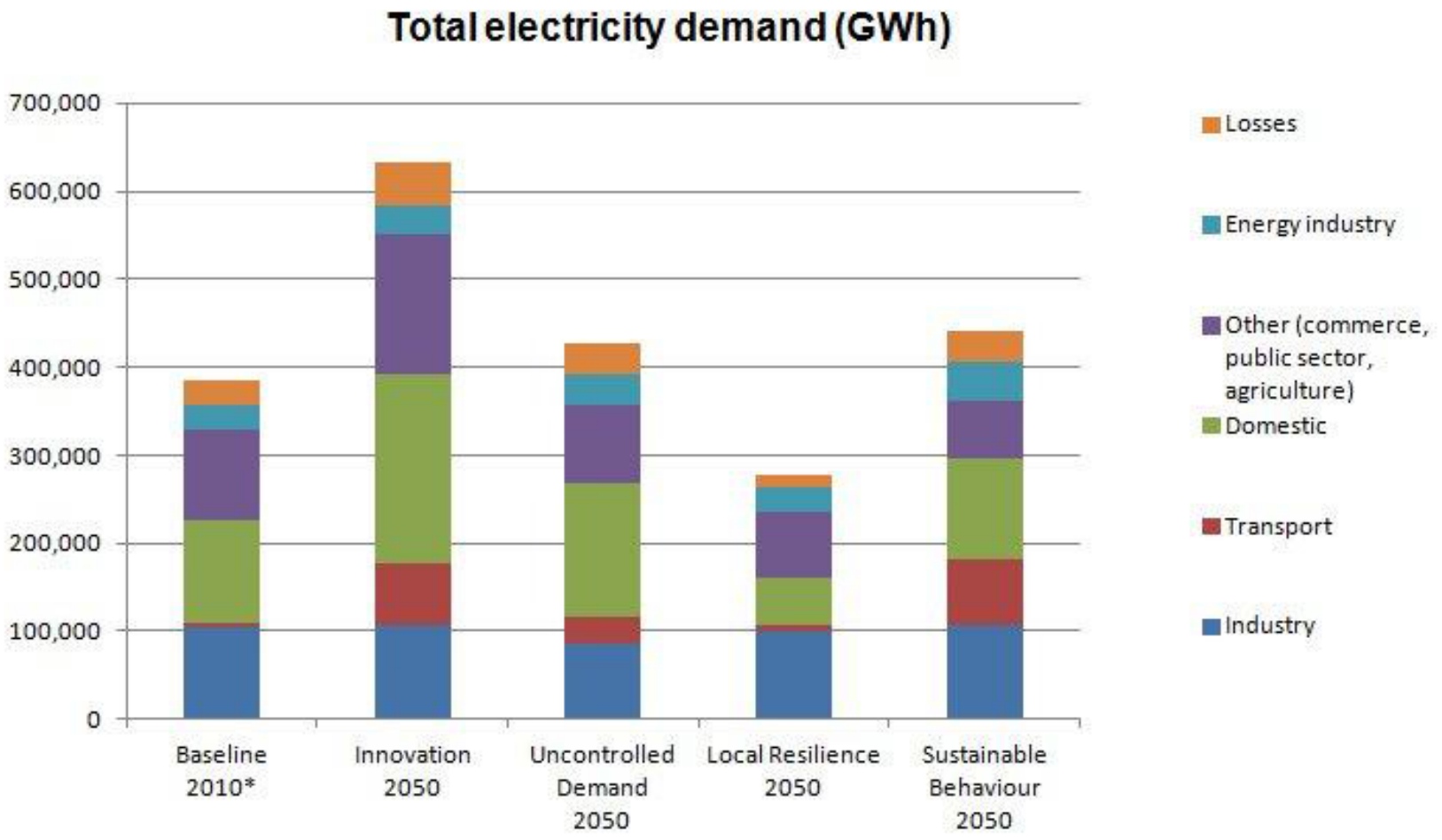
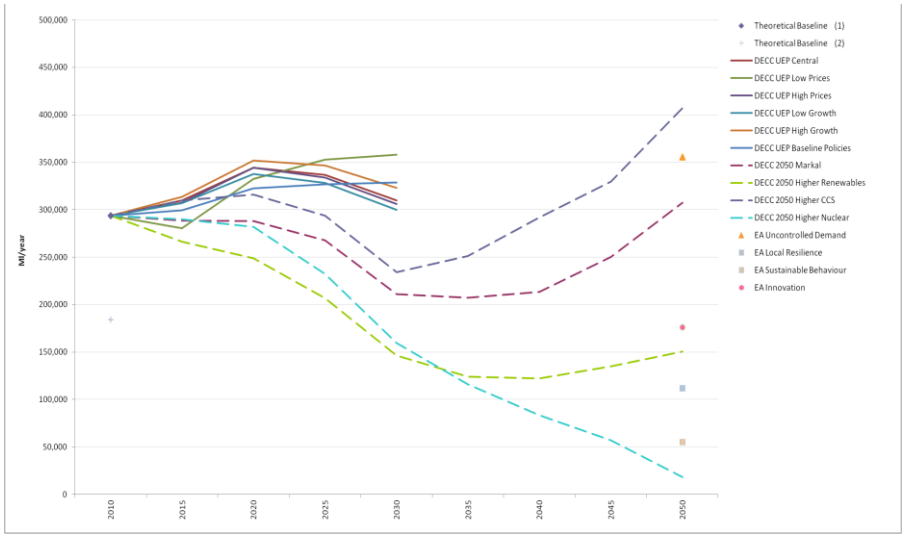
Electricity demand projections

GWh

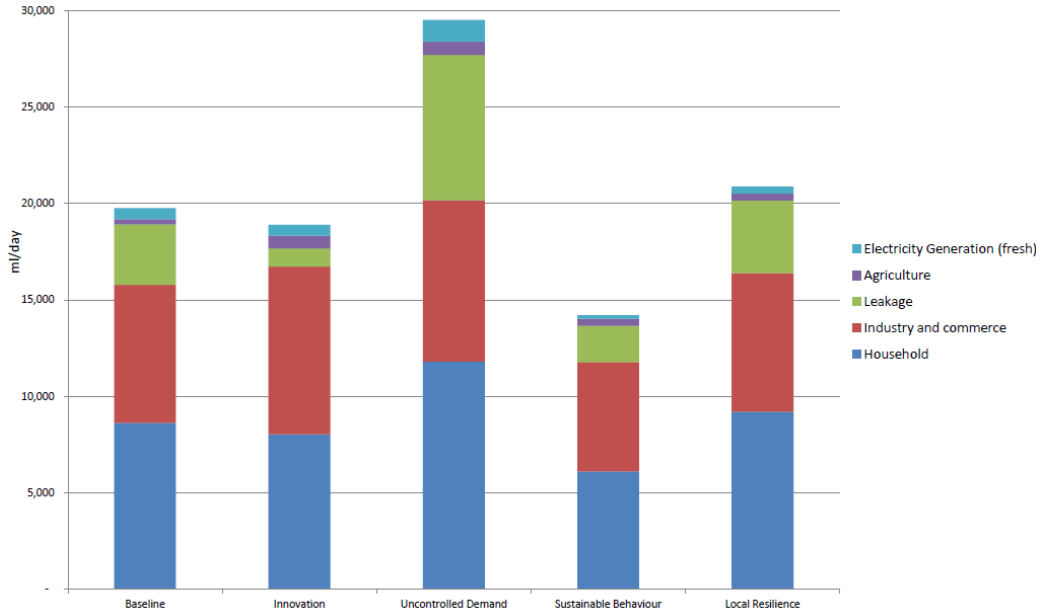


Total electricity demand under each scenario

Freshwater demand projections for electricity sector



All sector water demand projections



Geographical spread of unmet demand

Figure 1: Case for change results: Sustainable behaviour

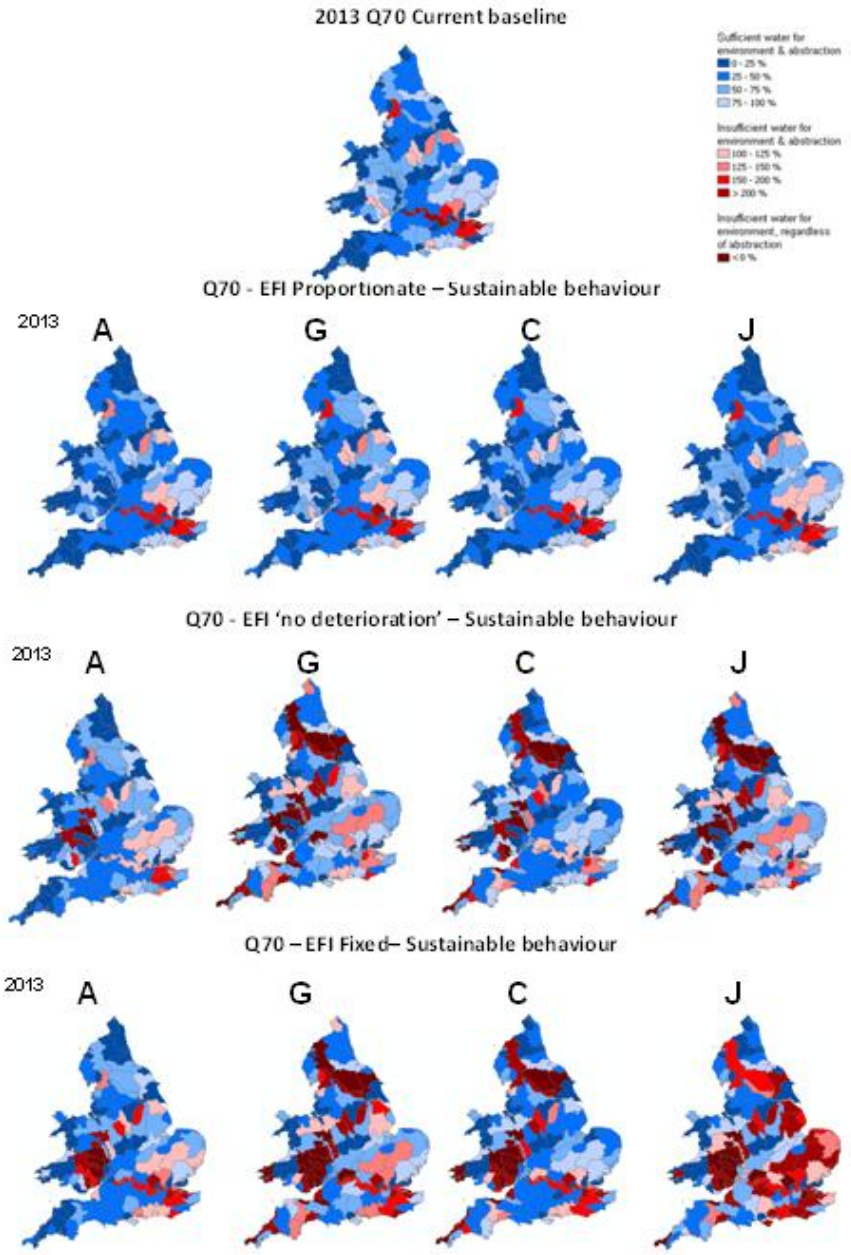
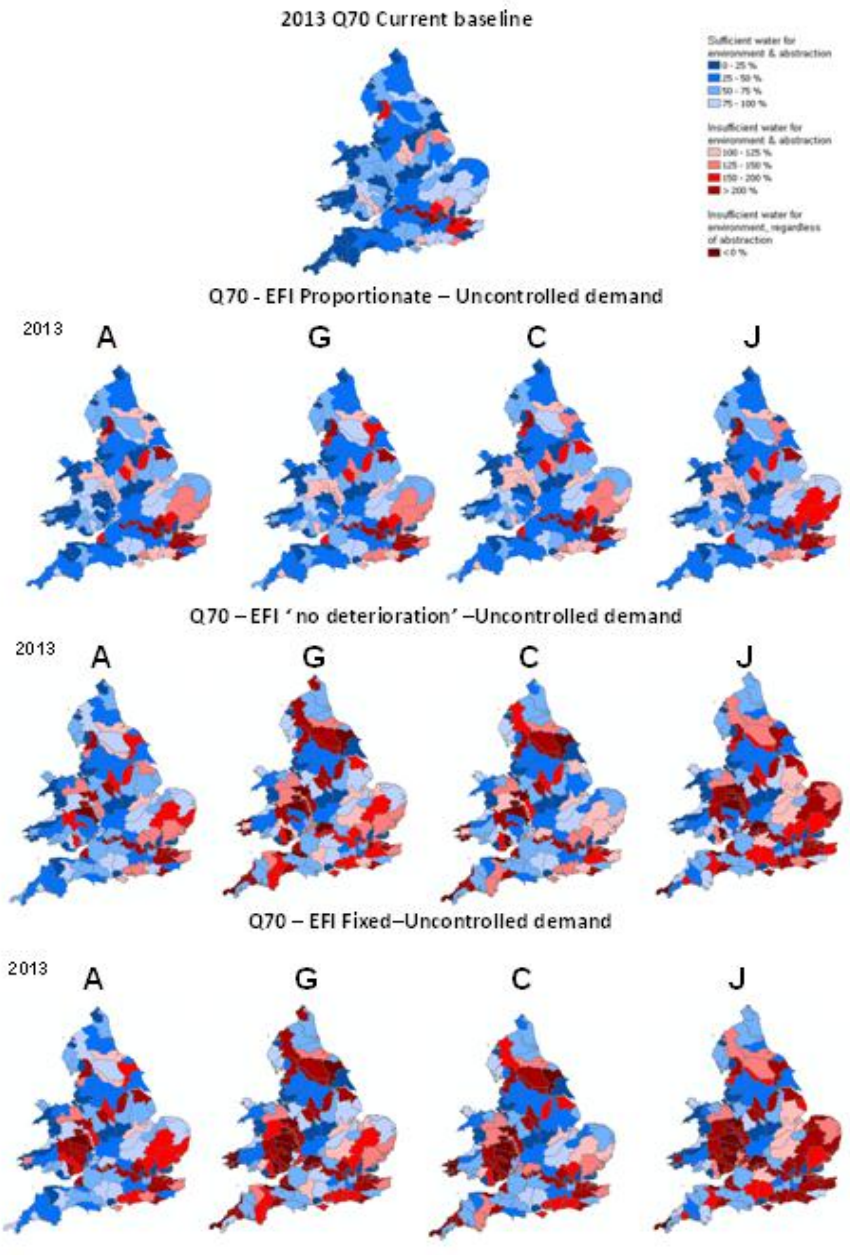


Figure 2: Case for change results: Uncontrolled demand



Electricity generation in freshwater catchments

- Looked at 13 freshwater catchments supporting large-scale thermal electricity generation
- Contributed 25% of total gross electricity produced in England in 2010
- Generated 59 million MWh of the total gross electricity in 2010.

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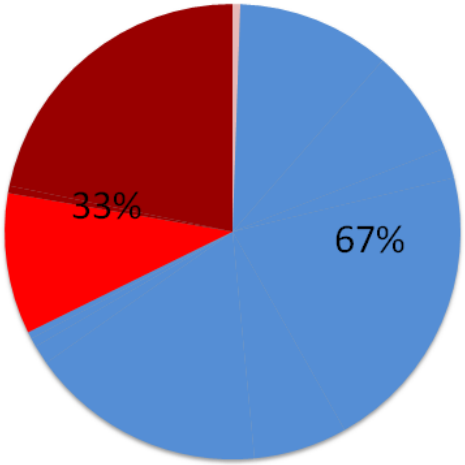
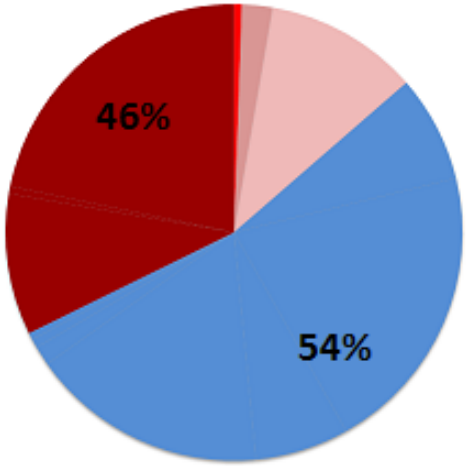
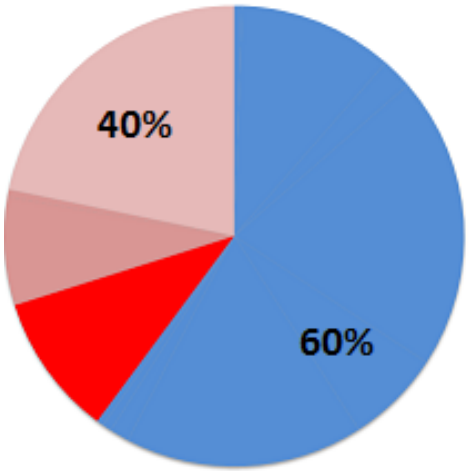
Resource status of freshwater catchments involved in thermal electricity generation & proportion of total gross electricity generated



Current situation (2010) (59 million MWh)



Uncontrolled Demand (2050) (11% increase in electricity generation)



Sustainable Behaviour (2050) (15% increase in electricity generation)

Water status	Water availability for environment & abstraction - % range
Water available	0-100 %
No water available	100% to 124%
No water available	125% to 149%
No water available	150% to 199%
No water available	>200%

Concluding remarks

Where next with this work?

- Continue to consider sector demand and catchment water availability
- Analysis results & electricity sector modelling have been a springboard for further research by academia and work by Defra

Looking forward

- Uncertainty means that our future approaches to regulation and governance need to be flexible and adaptable to deal with a range of futures
- Flexible and adaptable approaches need to be balanced against providing regulatory certainty for investment.
- The interplay between Water and Energy is just part of the story, in any catchment the interrelationship between all sectors needs to be considered.

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