WATERUK LONG TERM WATER RESOURCE PLANNING

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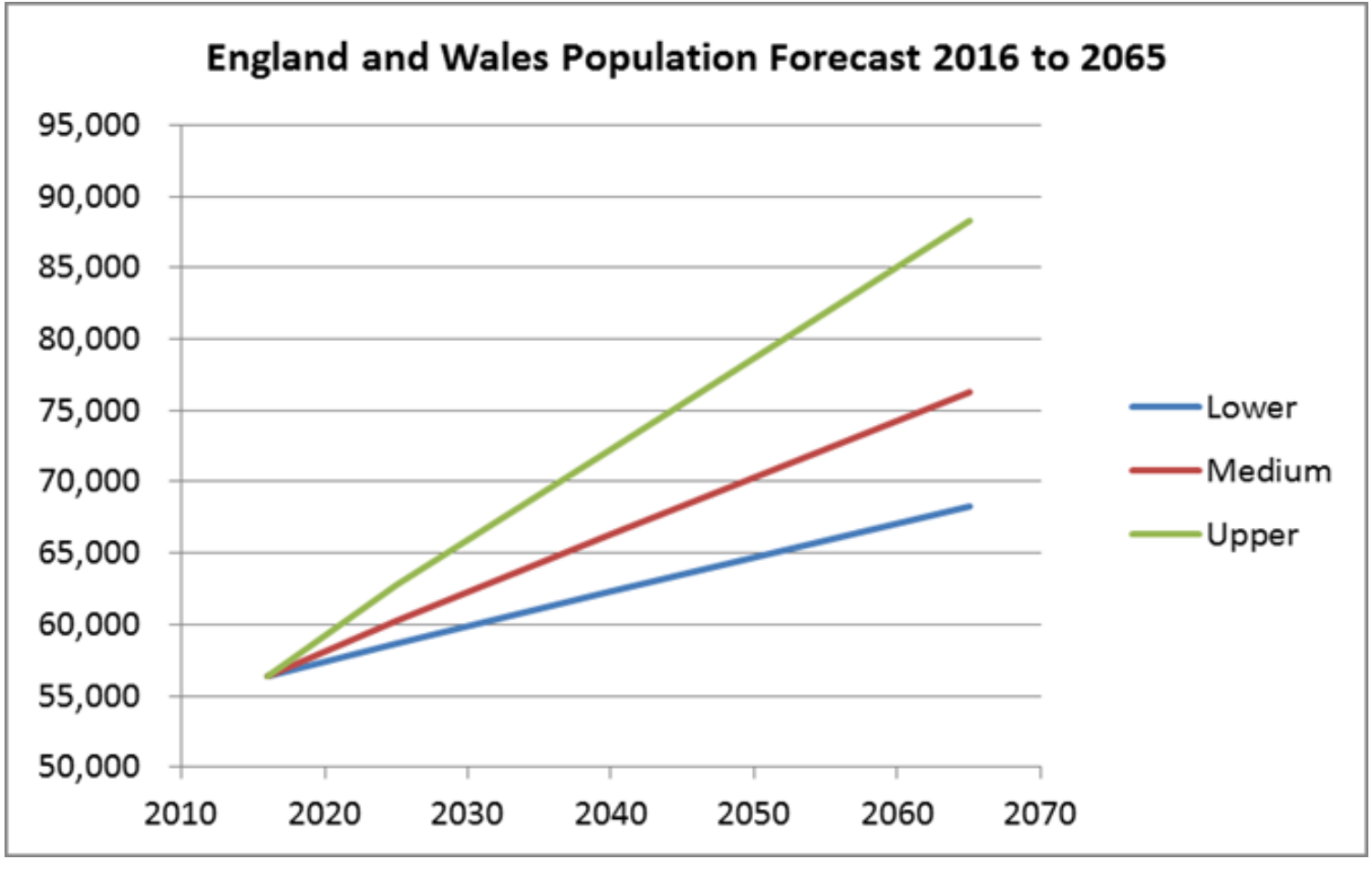
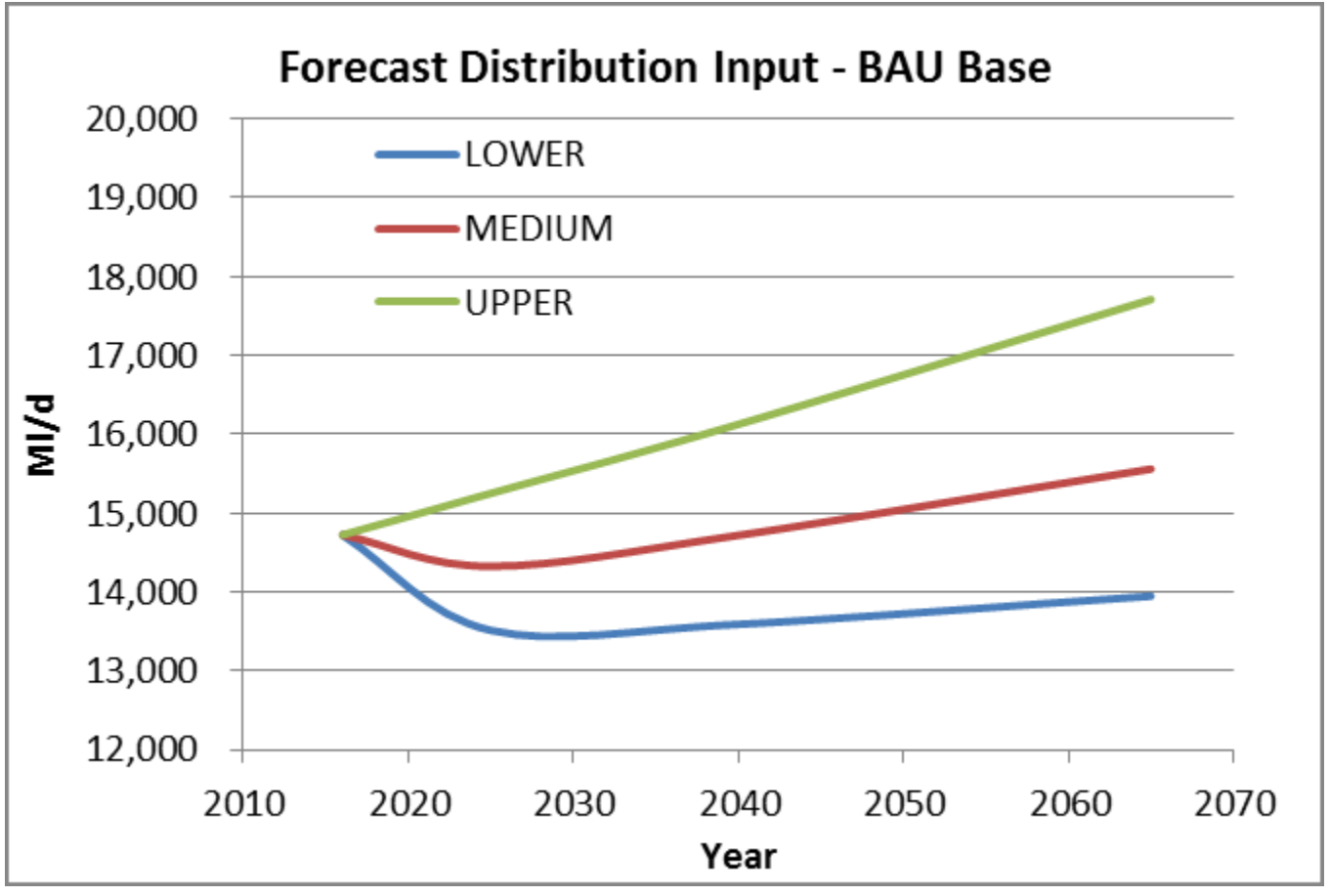
24/3/2017

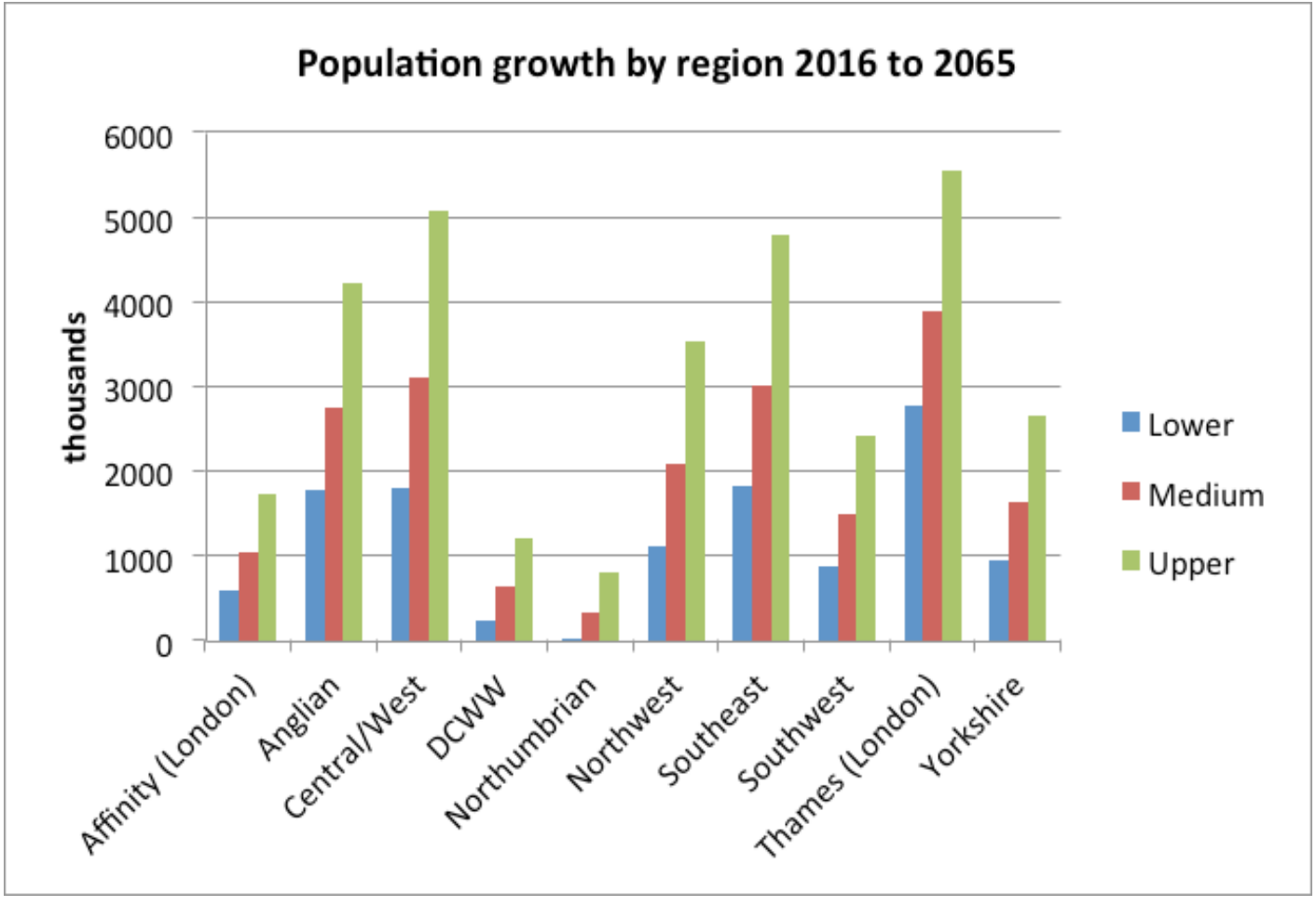
ENGLAND & WALES POPULATION FORECAST 2016 TO 2065



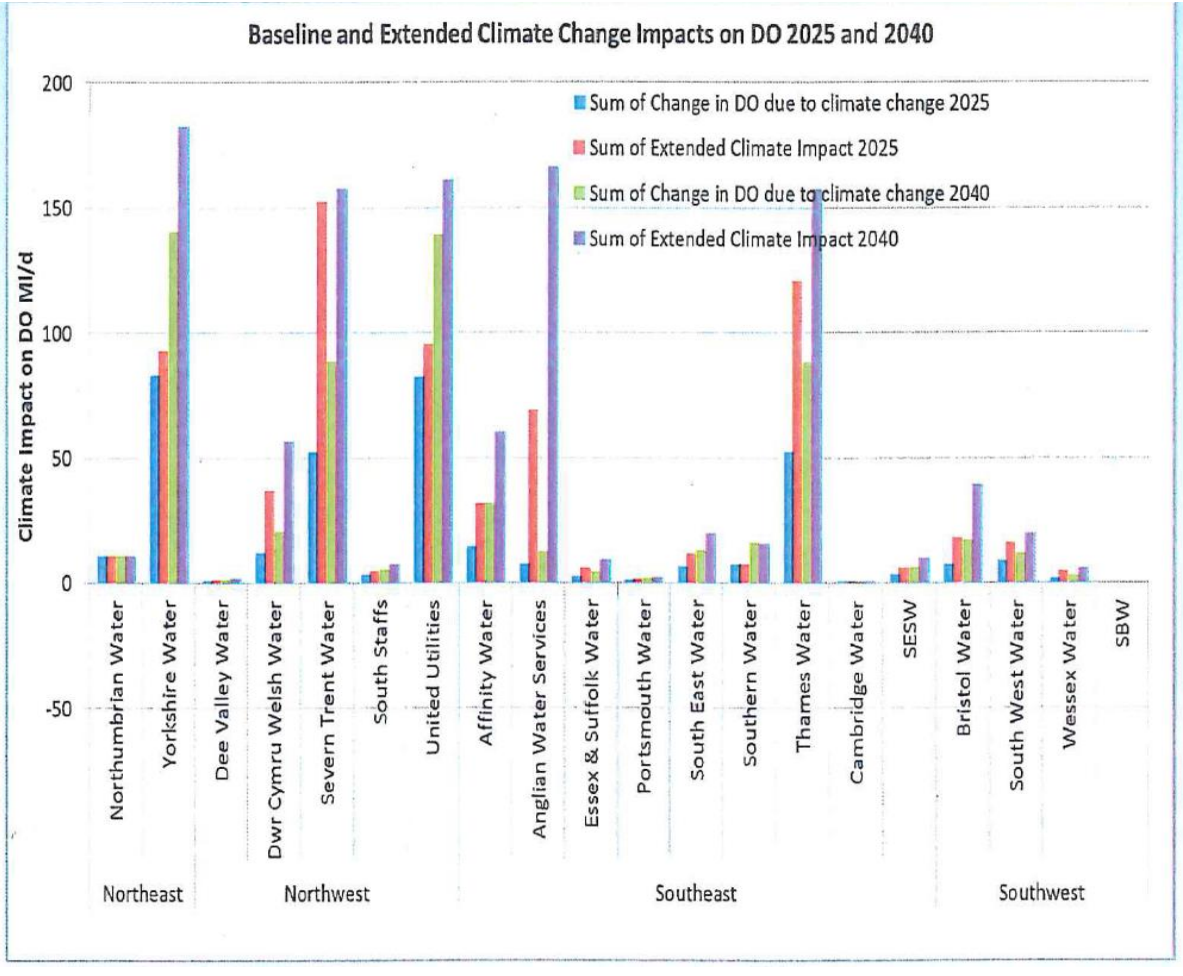
FORECAST DISTRIBUTION INPUT – BAU BASE



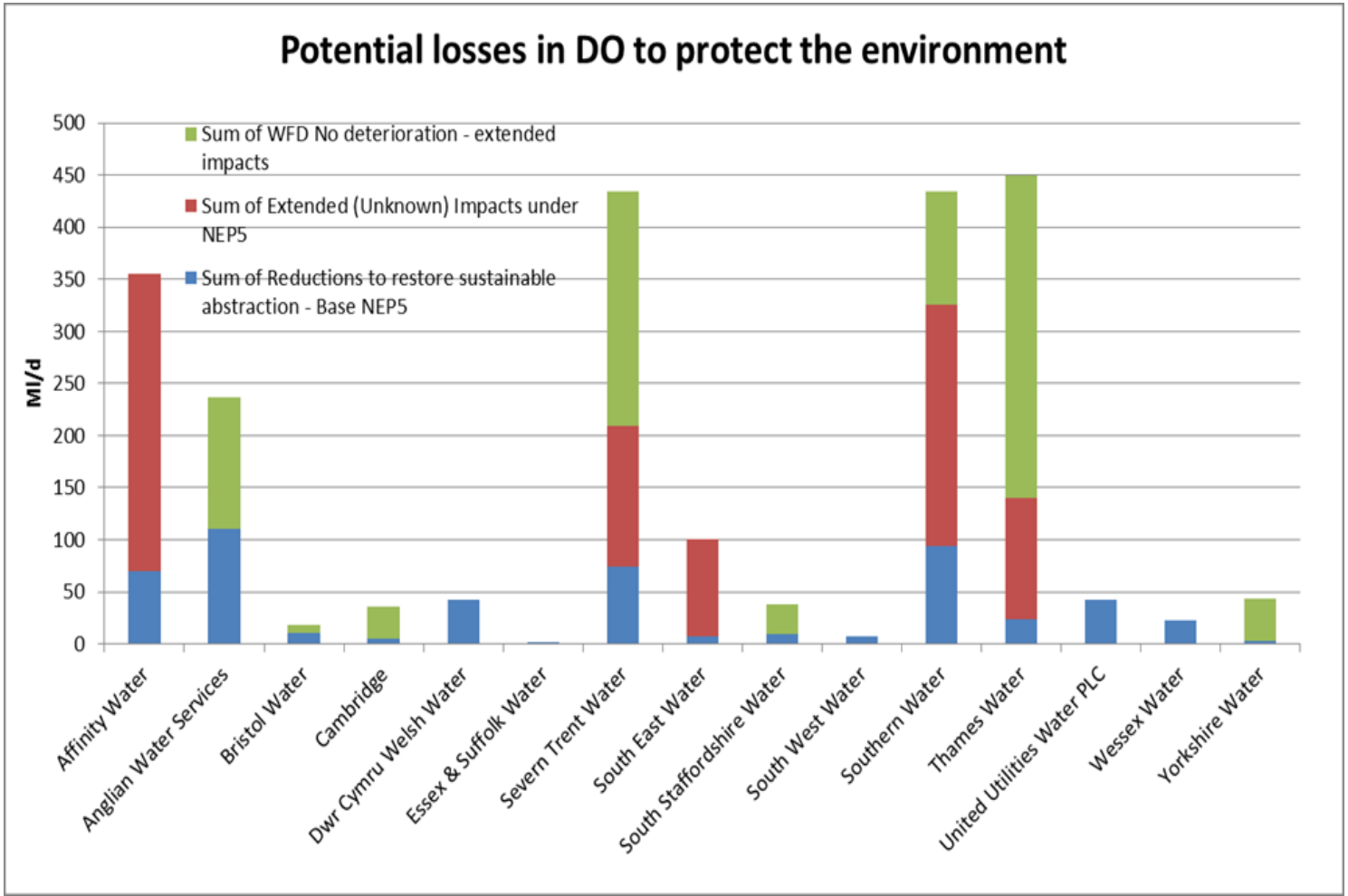
POPULATION GROWTH BY REGION 2016 TO 2065



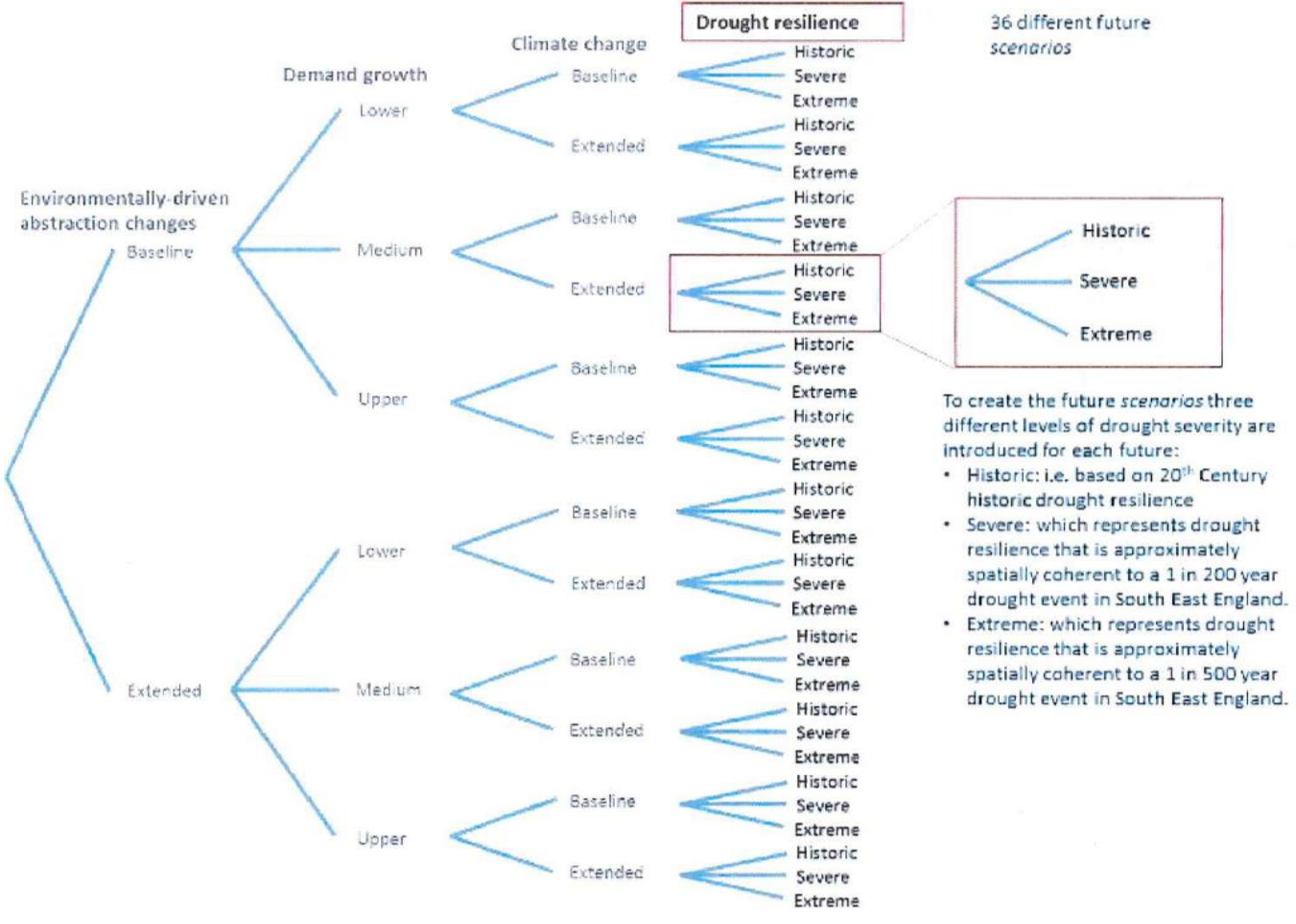
BASELINE & EXTENDED CLIMATE CHANGE IMPACTS ON DO 2025 & 2040



POTENTIAL LOSSES IN DO TO PROTECT THE ENVIRONMENT

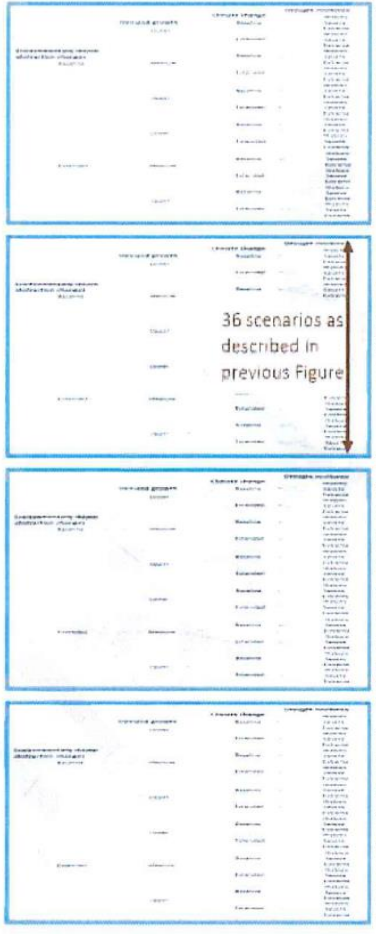


DROUGHT RESILIENCE



There are 4 different demand management strategies. Each strategy comprises a range of measures across metering, efficiency and leakage reduction

ach of the 36 *future* scenarios applied to each of the 4 otential demand anagement strategies. his results in **144 different otential "Portfolios"**. ach of these "Portfolios" will e designed to meet a ifferent potential deficit or urplus



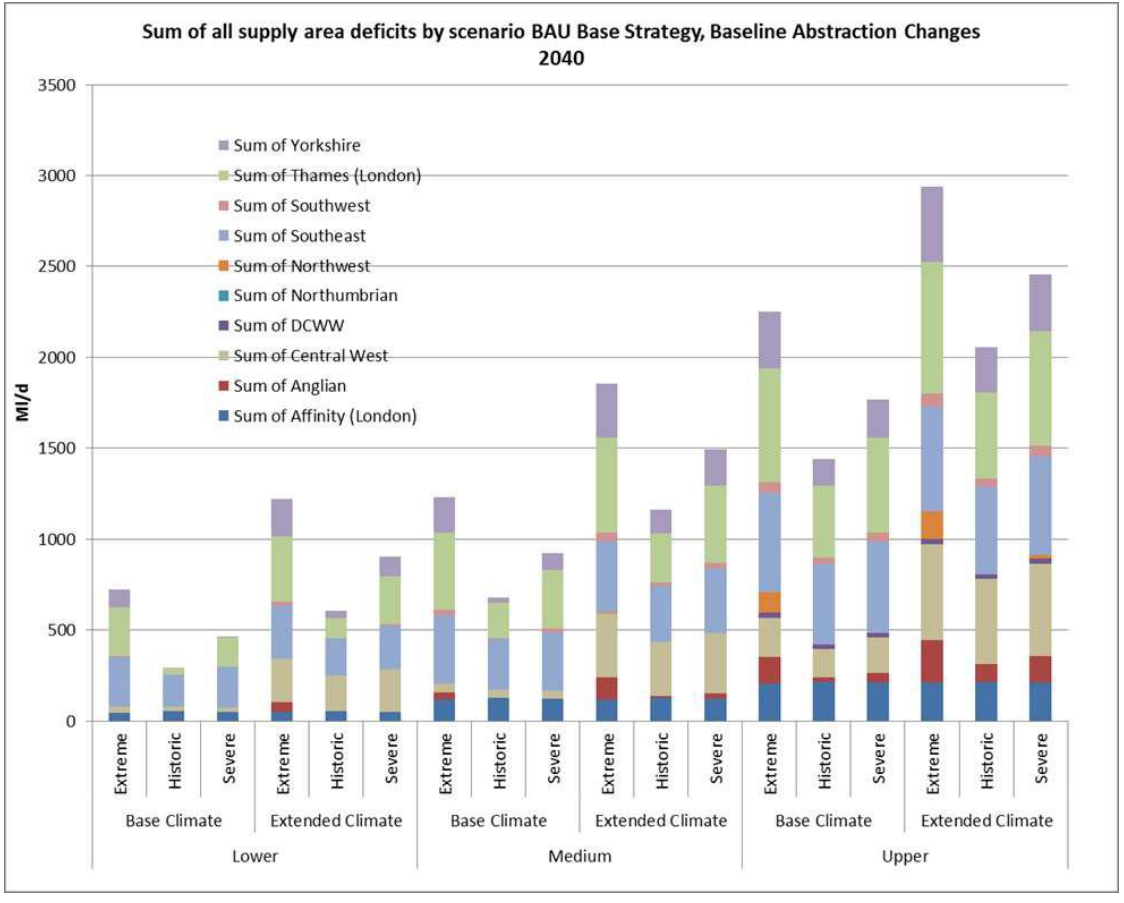
The **BAU Upper strategy** provides an alternative case where WRMP14 savings are not achieved – i.e. the WRMP measures to reduce PCC and leakage are largely ineffective or impossible to fully implement &/or do not achieve the savings envisaged. This does include an assumption that there will be background improvements in device efficiency and therefore a slight reduction in PCC over time.

The BAU Base strategy assumes that savings proposed under WRMP14 are achieved through water efficiency schemes, more sustainable new homes and reducing leakage per property.

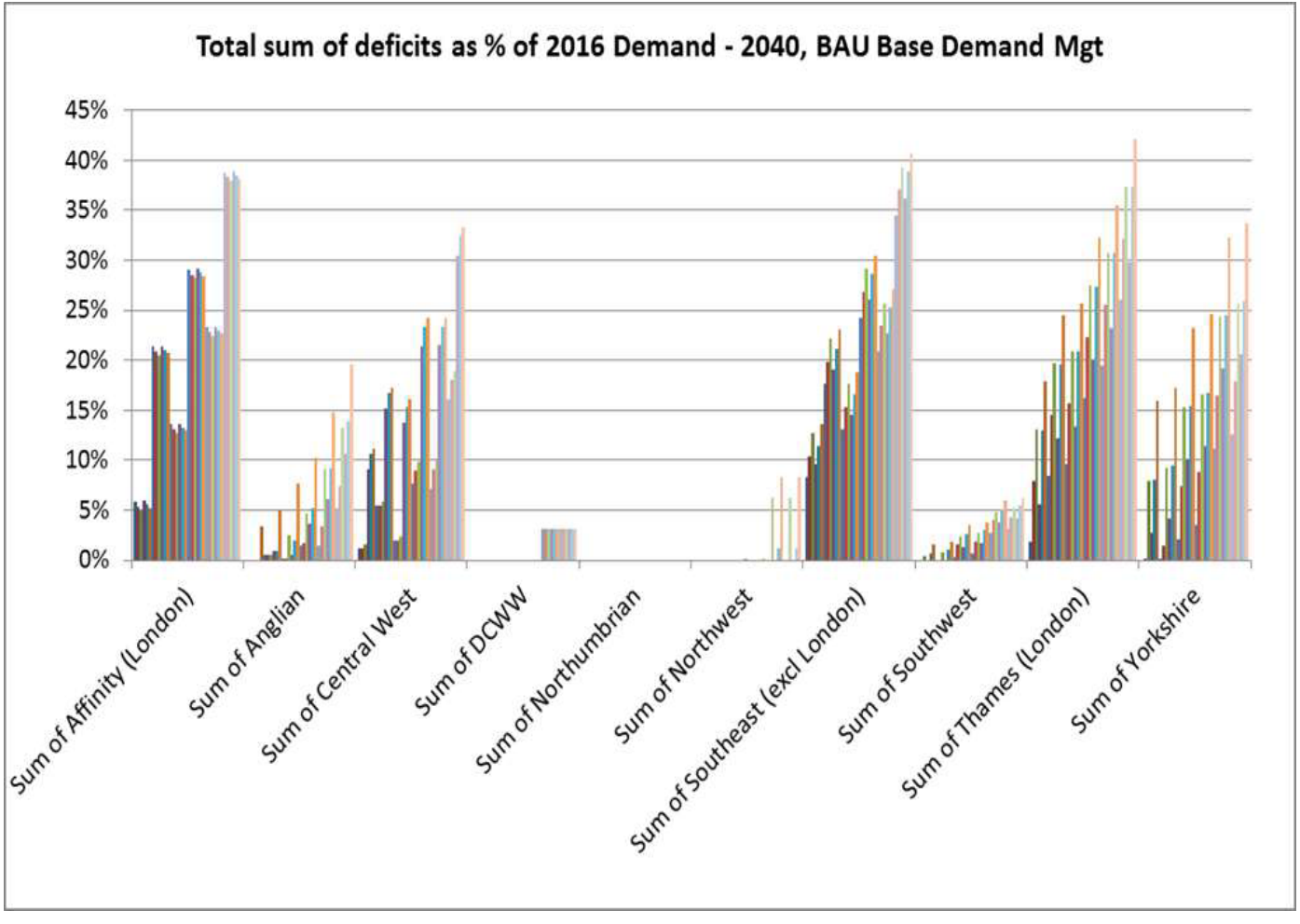
The **extended strategy** provides more ambitious savings that are expected to be cost effective but culturally challenging. For example, the savings might require retrofitting and/or smart metering 65% of existing properties to achieve 40 l/property/day saving; or 50% new builds achieving 105 l/h/d and retrofitting/smart metering 50% of existing homes; requires significant behavioural change. Leakage reduced through extended pressure control and active leakage control.

The **enhanced strategy** provides the most ambitious savings that should be feasible technically and economically over the time period, but would come at considerably more expensive than other strategies. For example, it might involve all new homes achieving at least 105 l/h/d, 50% with greywater reuse (80 l/h/d); major behavioural campaigns; and substantial mains renewal

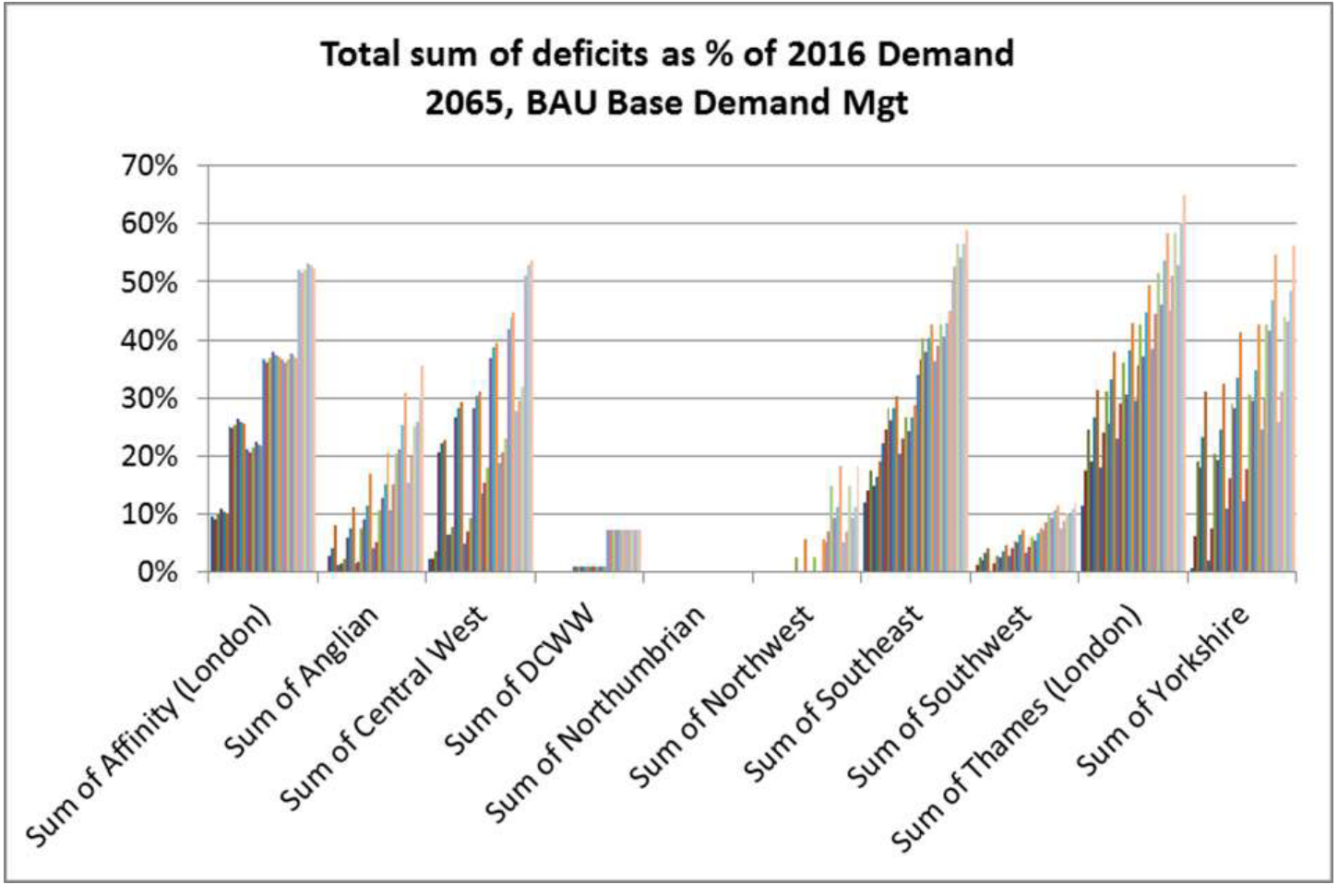
SUM OF ALL SUPPLY AREA DEFICITS BY SCENARIO BAU BASE STRATEGY, BASELINE ABSTRACTION CHANGES 2040



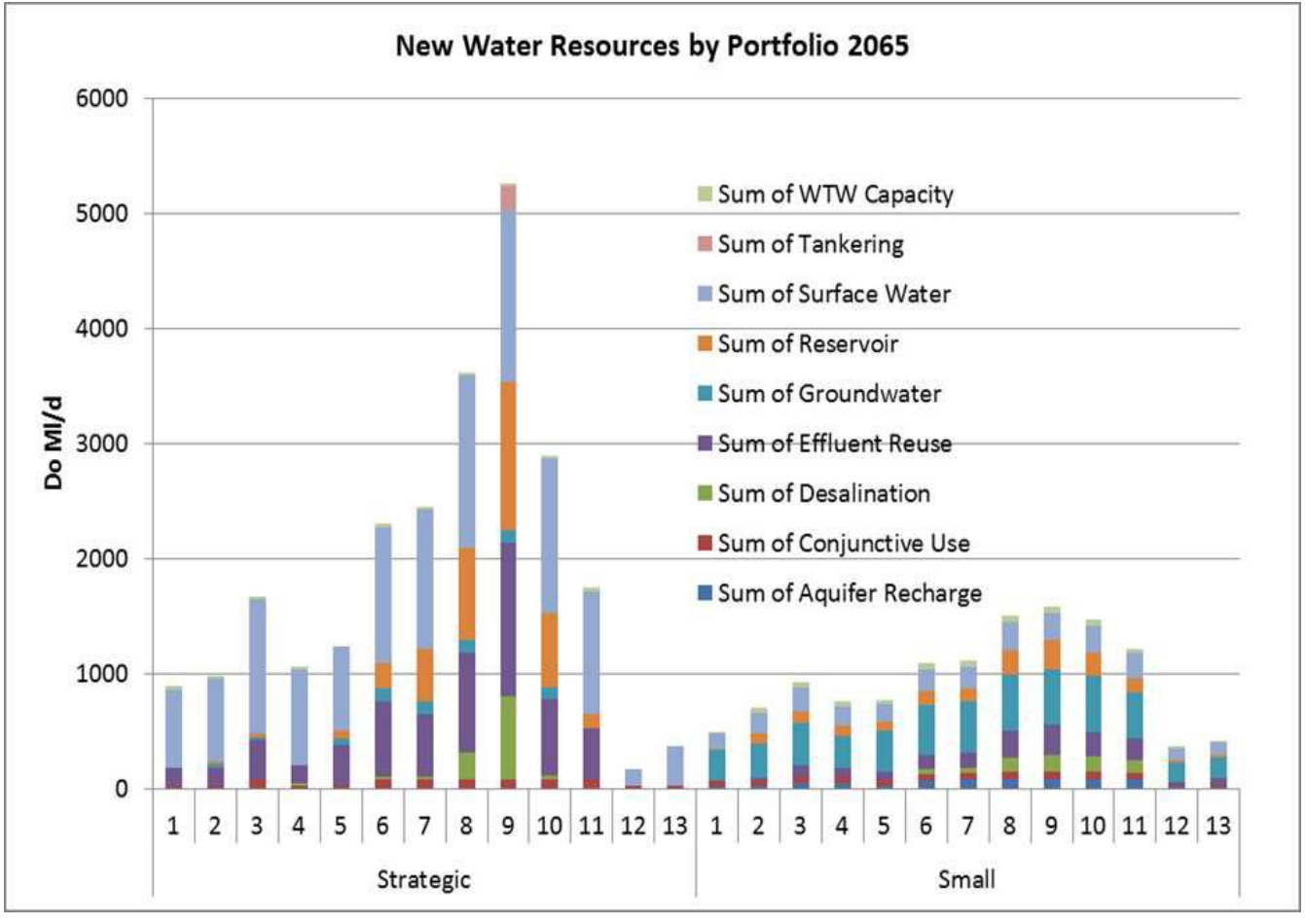
TOTAL SUM OF DEFICITS AS % OF 2016 DEMAND – 2040, BAU BASE DEMAND MANAGEMENT

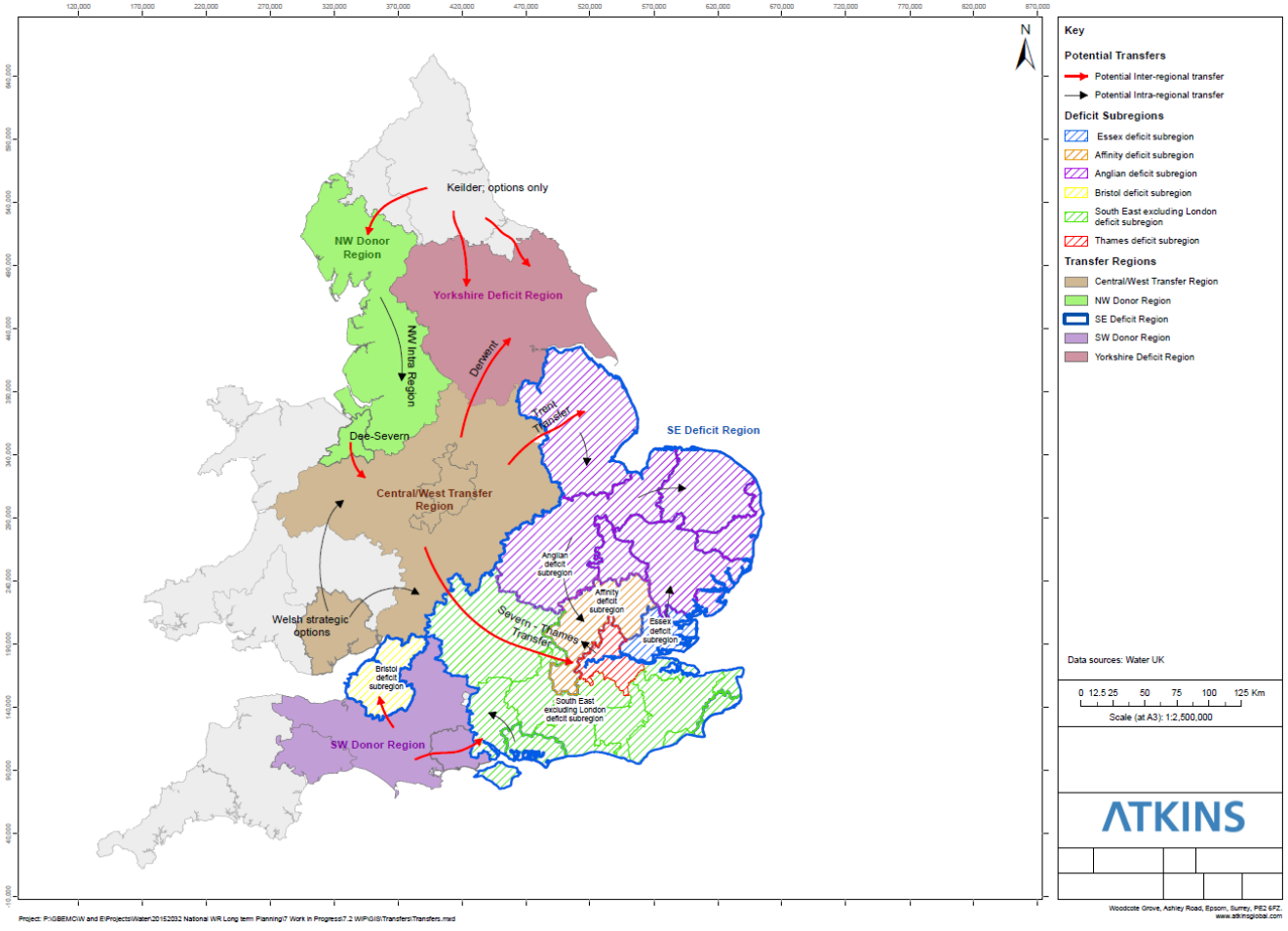


TOTAL SUM OF DEFICITS AS % OF 2016 DEMAND
2065, BAU BASE DEMAND MGT



NEW WATER RESOURCES BY PORTFOLIO 2065




N
Keilder; options only
NW Donor Region
Yorkshire Deficit Region
NW Intra Region
Derwent
Trent Transfer
SE Deficit Region
Dee-Severn
Central/West Transfer Region
Anglian deficit subregion
Affinity deficit subregion
Essex deficit subregion
Welsh strategic options
Severn Thames Transfer
Bristol deficit subregion
South East excluding London deficit subregion
SW Donor Region
Key
Potential Transfers
Potential Inter-regional transfer
Potential Intra-regional transfer
Deficit Subregions
Essex deficit subregion
Affinity deficit subregion
Anglian deficit subregion
Bristol deficit subregion
South East excluding London deficit subregion
Thames deficit subregion
Transfer Regions
Central/West Transfer Region
NW Donor Region
SE Deficit Region
SW Donor Region
Yorkshire Deficit Region
Data sources: Water UK
0 12.5 25 50 75 100 125 Km
Scale (at A3): 1:2,500,000
ATKINS
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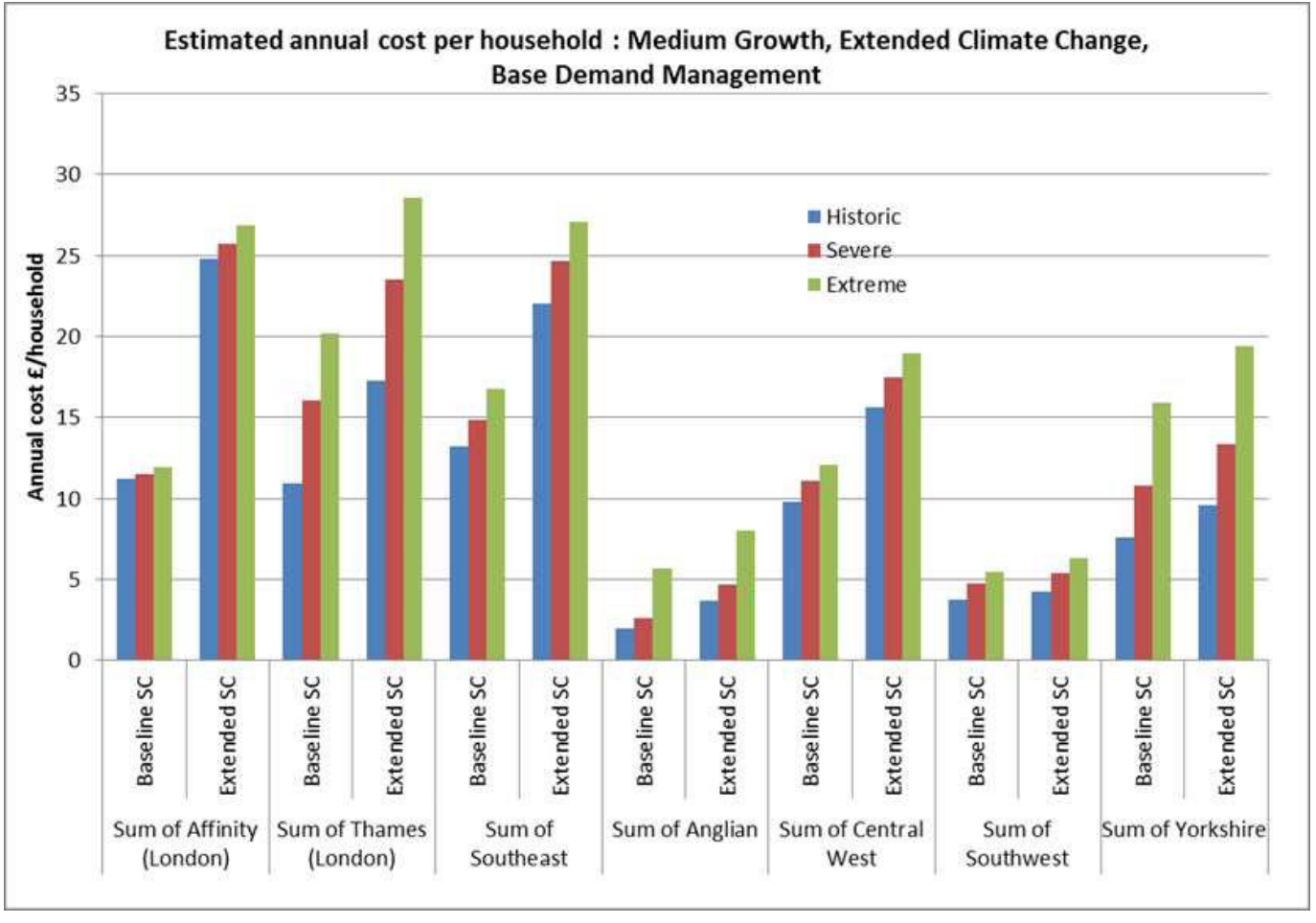
Project: P:\GBEMC\W and E\Projects\Water\2015203\2 National WR Long term Planning\7 Work in Progress\7.2 WP\GIS\Transfers\Transfers.mxd


Estimated annual cost per household : Medium Growth, Extended Climate Change, Base Demand Management
Annual cost £/household
35
30
25
20
15
10
5
0
Historic
Severe
Extreme
Baseline SC
Extended SC
Sum of Affinity (London)
Sum of Thames (London)
Sum of Southeast
Sum of Anglian
Sum of Central West
Sum of Southwest
Sum of Yorkshire

vulnerable to droughts that are more severe than the historic record, it generally maintains a small supply surplus under most Portfolios in 2040. It then requires transfers from Anglian in many Portfolios in 2065, so becomes part of the overall resilience picture described under

There is a strong economic argument for considering a strategy that provides resilience to ‘extreme’ drought (central estimate benefit-cost ratio of greater than 5:1); this would typically cost less than £8/household customer/annum (£10 under drier climates), compared with the ‘baseline’ worst historic drought resilience.

PER CAPITA CONSUMPTION

From CCWater report:-

company	ST	UU	YWS	AWS	NW
l/h/d	126.4	130	133	133.4	141.6

2015/16	UM pcc	UM occ	M pcc	M occ	% M	L/p/d M
UU	142	2.41	108	2.21	39	239
NW	148.4	2.59	133.5	1.79	32	239