Innovative business models for water supply and sanitation

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Richard Franceys
Water Management Group, Sustainable Systems, Cranfield University
Innovative business models for water supply and sanitation

- Views on *regulatory implications* of innovative business models
- from the perspective of an academic and a regional member of the Consumer Council for Water, England and Wales (*though the views are necessarily personal, not those of CCWater*)
  - Metering, removal of progressive tariffs & consideration of IBTs
  - Housing developer ‘Inset Appointments’
  - Sustainable urban drainage
  - Greywater and rainwater recycling
  - Revenue caps
  - Menu Regulation

- Views on *regulatory implications* for achieving a Universal Service Obligation to slums in emerging economies/BRICs/ LMICs
Water & Sewerage Investment England & Wales
1919-2010
£million (2003 prices)
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1919-2010
£million (2003 prices)
Water & Sanitation Investment as percentage of GDP
(2004-2010 projected GDP on trend)
Incentive regulation is ‘new’ for many?

But diminishing returns now? Hence new models?
‘New’ Metering

- Not so new for most . . But for England & Wales
  - Increasing cost of water by over 30% ?
    (‘annual metering charge may reach £70/hh
     by end of AMP4’ ?)
  - The chance for second home owners and/or
    expensive house, high income, one/two
    person households to make significant
    savings (perhaps not significant to them?)
  - Allows many newly metered customers to think that they will be saving
    money though in the long term the fixed cost nature of the business
    will simply require their new volumetric tariffs to be adjusted upwards
  - Removes the benefits of existing progressive tariffs, to the detriment of the
    higher household size poor
  - Requires the ‘Vulnerable groups tariff’ (now ‘WaterSure’) for high
    household size social welfare & health needs – but very limited take-up
  - Is leading to the proposed introduction of Increasing Block Tariffs (‘they
    are much fairer’) – pilot just starting …..
  - And may reduce water demand by approximately 10% ……. 
Customers, Consumption & Competition?

Competition?

Customers, Consumption & Competition? 24,185,000

>250 ML >100 ML 50 ML 20 ML 10 ML 5 ML 2.5 ML 1 ML 0.5 ML 0.15 ML

30,000?

??
New business opportunities

- ‘we see that the combined activities of water and sewerage retailing make up less than 7% of the value chain’
- Ofwat consulting on ‘unbundling’ with accounting separation as a first step?

- COMPETITION AND REGULATION IN WATER: STRIKING THE RIGHT BALANCE
- Regina Finn, Chief Executive, Water Services Regulation Authority, November 2007
Housing developer ‘Inset Appointments’

- ‘Inset Appointments’ allowed for ‘customers’ of more than 50 megalitres of water per year. Previously (and by assumption) only for large commercial users – steel makers/breweries etc – 11 to date but now:
- ‘The economic regulator has granted Independent Water Networks Limited (IWNL) an inset appointment that will allow it to supply a 950-home development at Long Croft Road, in Corby, Northamptonshire.
- IWNL will serve its customers by buying water from Anglian Water and discharging sewage to Anglian Water's Network.
- IWNL has said that its 2007-08 water volumetric charge will be 5% lower than that of Anglian Water. Ofwat 17 October 2007
- And now considering and inset ‘to a major development of nearly 5,100 homes and 51 business units at Priors Hall, in Corby’. Ofwat 26 October 2007
- Just previously a proposed inset to a 935 home development in Old Sarum, Wiltshire ..
New Inset Appointments

• Thoughts:
  • The bulk water tariff differential, through which the new appointees can find the finance to pay for their distribution system/sewerage system and customer billing and profit margin, may well be unfairly taking advantage of the existing urban-rural cross subsidy …?
  • CCWater wondering what happens if the appointee goes bankrupt?
  • Could the appointees increase prices above the existing company’s tariffs? Customers would still have no choice of provider …..
  • Customers of appointees could receive a better as well as cheaper service
  • Developer may get more reactive and cheaper pipe laying service than from incumbents
  • It has been noted anecdotally that Anglian water immediately began improving its ‘Developer Services Department’ …. And this local comparative competition may improve services for current large user customers ‘as the water companies work to keep them as customers’
  • No mention yet of self-treatment of wastewater ….
New Inset Appointments

- Thoughts on regulation:
  - Who will undertake water quality testing at the customers’ taps?
  - What will be the ongoing process for ‘approving’ annual tariff changes? Who will be consulted?
  - Unclear levels of services. It may not always be clear who it is responsible for providing water to fire hydrants and the required pressure at customers taps;
  - Will the new appointees have to complete full ‘June returns’ for Ofwat?
  - Will the regional Consumer Council for Water have to ‘audit’ the new provider’s complaints as usual? Appeal on customer’s behalf when not satisfied? Will the new providers have to attend CCWater meetings?
- Is this really a good way forward?
  - It has been suggested it might be better to look to geographical/horizontal ‘disaggregation’ of the largest companies – to improve comparative competition and management commitment ….
Sustainable urban drainage
Vacuuming urban drainage?
Greywater and rainwater recycling business opportunities

- Northstowe, north of Cambridge, has been chosen as the next ‘Eco-town’ and aims to reduce the current average potable water demand for England and Wales by 50% (~80 l/h/d) (Communities & Local Government, 2007b). To achieve this reduction rainwater and/or greywater use will be required.

- Regulatory/CCWater concerns
  - Who will deliver and manage and maintain (satisfactorily) the recycling systems?
  - Proposals to size pipes to minimise demand? But why shouldn’t customers have the right to purchase and use the water they wish to use? But at a price that reflects its increasing scarcity value?
Relative percentages of project types identified through the literature review

Relative percentages of reclaimed water use from the projects identified in the review

FINANCIAL AND CONTRACTUAL MODELS FOR GREYWATER REUSE AND RAINWATER HARVESTING
Rosslyn Stewart, Cranfield MSc Thesis, 2007 in conjunction with Cambridge Water
Sustainable homes

Code of Sustainable homes levels, water saving requirements and estimated cost of achievement (Sources: CLG, 2006 and Environment Agency, 2007)

<table>
<thead>
<tr>
<th>Code Level</th>
<th>Water consumption l/h/d requirement</th>
<th>Cost including VAT (£ at 2006 prices)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>120</td>
<td>£697</td>
</tr>
<tr>
<td>3-4</td>
<td>105</td>
<td>£792 (Amount to reach 100 l/h/d)</td>
</tr>
<tr>
<td>5-6</td>
<td>80</td>
<td>£3,737</td>
</tr>
</tbody>
</table>

The announcement from Communities and Local Government in July 2007 has meant that the capital costs will be more easily found as in the future new builds are likely to require water reclamation systems to meet code level 5/6 of the Code for Sustainable Homes.

Schematic of the rainwater harvesting system used at Millennium Green, Nottinghamshire (Environmental Products, 2007)

Key
1. Naylor Freerain typical system components
2. In-tank integrated, cross-flow self-cleaning filter.
3. Calmed Inlet filling device to ensure clean oxygen-rich water.
4. PE Reinforced tank, with adjustable manhole.
5. High-quality, stainless-steel, submersible pump.

Gusto experimented with several different systems, but none fitted their requirements (Sponge, 2007). Therefore, the developer decided to create their own system, which “incorporates a [3500l] underground storage tank, self-cleaning in-tank filters and a submersible pump”. (Spongnet, 2007). The rainwater tanks are large enough to supply non-potable water supply for 18 days and the tanks are automatically topped up via potable supply if the non-potable supply is too low (Sustainable Development Commission, 2007). When the tank is topped up with potable water a signal light informs the residents (Sustainable Development Commission, 2007). Water consumption in the houses has reduced by an average of 50% with the use of the rainwater harvesting technology and other water conservation tools (Spongnet, 2007). Payback period >18 years (capex £2,500 – annual savings £135)
Regulatory implications?

- Will the developer be investing (& recovering from house purchasers…) to reduce the demand on the water companies water resources & treatment?

- Will there be any ‘deal’ on infrastructure charges? Developers will still need to connect ….

- Who will operate and maintain the household systems? Licensing implications for:
  - Any danger of cross-contamination? DWI implications?
  - Who will operate and maintain the community systems? Do they become ‘inset’ wastewater treaters? (BedZED being transferred to Thames Water? Oeko-Technik-Park, Hamburg 104 apartment system abandoned ..)
Regulatory implications for ensuring revenue for financeability?

- Water providers incentives and new business models acting ‘against’ water conservation/water demand management?
- Regulator as meter take-up and water efficiency predictor? as ‘Weather Forecaster’?

- Ofwat noting problems in revenue forecasting due to:
  - ‘Inaccuracy in forecasting volumes
  - Inaccuracy in forecasting new properties
  - Inaccuracy in forecasting optional metering
  - Metering characteristics
  - Extent of water efficiency
  - Number of existing properties identified and added to the billing system’

  Ofwat RD 14/07, July 2007
We propose to introduce a mechanism that corrects for any revenue over- or under recovery at each price review in net present value terms (that is, with interest). The first time we will use the mechanism will be at the 2014 price review for the years between 2010 and 2015. The mechanism will remove both the current scope for a company either to outperform or underperform on revenue and the disincentive for a company to promote water efficiency to measured consumers. Correcting at successive reviews has the same benefits as a revenue cap, but avoids the potential price instability that revenue caps can introduce.'
New ‘Menu regulation’

‘If a company chooses a level of expenditure 105 and then subsequently delivers expenditure of 95 it will earn a reward of 1.31 and recover a total of 96.31. However, had the company originally chosen 95 and delivered 95 its reward would have been 1.56 and its total recovery 96.56. This is the incentive compatible nature of the menu – companies maximise their rewards (or minimise their penalties) by choosing ex ante the level of expenditure they expect to deliver ex post.’

Menu regulation proposals for PR09 consultation paper, Ofwat, October 2007
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• Views on *regulatory implications* for achieving a Universal Service Obligation to slums in emerging economies/BRICs/ LMICs

• Not just regulatory economics …
  • Also improved techniques …
Innovative business models needed with regulatory support to a universal service obligation
Water & Sanitation and Economic Development

'A secondary city'

MDG Goals?

Accelerated path?

Demand responsive 1.6% pa path?

Low-income countries

MDG Goals?

GDP pc ‘real’

$30,000

$25,000

$20,000

$15,000

$10,000

$5,000

$ 5,000

Two Hundred Years at 1.33% GDP pc growth pa
‘Water Choice points’
‘Super Standposts’

• Customer choice
• Even/especially for poor customers
  - Buy by the bucket
  - Buy by daily filled household tank
  - Buy by metered household connection
  - Buy by prepaid meter
  - Buy by volumetric controller

• **Swap** between alternatives as situation allows – all ‘changeable’ as situations change – no new or ongoing connection charges & immediate disconnection and reconnection as household finances allow

• More innovative business models needed ….