"Water pricing is a hot issue in communities across the country. Yet it remains an almost totally untapped option for helping ensure our water service infrastructure -- the pipes, pumps and reservoirs -- is well maintained and up to date."

Kirk Stinchcombe
Econnics
Worth Every Penny: Conservation-Oriented Water Pricing

CAVI Parksville Workshop
Oliver Brandes and Kirk Stinchcombe
9 September 2010
Project Mission

To raise awareness among water utility practitioners and government decision makers about the effect that pricing can have on water demand and financial viability

-- To catalyze a national dialogue --
“I'm right there in the room, and no one even acknowledges me.”

The New Yorker, 9/18/06
Presentation Overview

1. What is Conservation-Oriented Water Pricing?
2. Canada’s Current Situation
3. Setting Up a Conservation-Oriented Pricing System
4. Mitigating Potential Downsides
5. How to Get There From Here
1. What is Conservation Oriented Water Pricing?
What is Conservation-Oriented Water Pricing?

A rate structure adopted by a water service provider where:

1. The costs of providing the services are recovered
2. Individual customers are metered and pay for the volume of water they use
3. The price signal is sufficient to affect individual decisions and encourage conservation and efficiency
What the Price of Water Does:

1. provides enough revenue to at least cover the full costs of providing the service; financial stability;

2. provides a financial incentive for customers to use water efficiently;

3. provides information about how much water consumers demand; and,

4. promotes innovation.
2. Canada’s Current Situation
Conservation-Oriented Pricing: Three Prerequisites

1. Metered water use
2. Volume based charging
3. A rate sufficiently high to affect decision making
As of 2006, 63.1% of residential customers were metered...
Percent of Canadian Single Family Dwellings That Are Metered (2006)

Responding Population = 27,927,531
How Canada Fares: Volume Based Charging

As of 2004, 29.9% of Canadian residents are still billed on a flat rate or tax assessment basis.

And, again, there is considerable province-to-province variability.
How Canada Fares: Volume Based Charging

But... we are improving over time...

How Canada Fares: Meaningful Prices

Comparison of Unit Prices of Water Services and Wastewater Services to Households, including Taxes (USD/M³)

Water Supply And Sanitation Bills As A Share Of Disposable Income

Average net disposable income

How Canada Fares: Meaningful Prices

But... again, improving over time...

If the price signal is correct...

the majority of people and organizations will change they way they value water and change their behaviour

- when using water and when buying water-

- using technologies -

because they recognize that efficiency and conservation will save them money
A tale of two cities...
VS. $428+HST $748+HST
A tale of two cities...

<table>
<thead>
<tr>
<th>Kirk’s House</th>
<th>Oliver’s House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water from CRD (Sooke Reservoir)</td>
<td>Water from CRD (Sooke Reservoir)</td>
</tr>
<tr>
<td>3.2 km from Oliver’s house</td>
<td>3.2 km from Kirk’s house</td>
</tr>
<tr>
<td>3 people in the home (2 adults, 1 kid)</td>
<td>3 people in the home (2 adults, 1 kid)</td>
</tr>
<tr>
<td>Older home</td>
<td>Older home</td>
</tr>
<tr>
<td>BC Hydro electricity ($0.0627/kWh)</td>
<td>BC Hydro electricity ($0.0627/kWh)</td>
</tr>
<tr>
<td>Water rate: $0.9040/m³</td>
<td>Water rate: $1.083/m³</td>
</tr>
<tr>
<td>Combined wastewater rate: nil</td>
<td>Combined wastewater rate: $0.915/m³*</td>
</tr>
<tr>
<td><strong>Total rate: $0.9040/m³</strong></td>
<td><strong>Total rate: $1.998/m³</strong></td>
</tr>
</tbody>
</table>

* Saanich wastewater charges are based on winter consumption
Payback period: 12.7 years*

Payback period: 6.8 years*

* Based on marginal cost of Amana basic model front loader vs. basic model top loader; factors in volumetric energy, water and wastewater costs
Potential Impacts of Water Under-Pricing

- Higher operating costs
- Higher capital costs over the long term
- Unnecessary environmental impacts
- Reliance on less efficient tools to curb excessive consumption
- Fairness: those who waste pay similar charges to those who conserve
- Stifled innovation
And then there is the problem of infrastructure deficits...
Revenues And Expenditures Of Canadian Municipal Water Agencies: 1988 To 2007

3. Setting Up a Conservation-Oriented Pricing System
How Much Revenue Do You Need?

Determined by *Full Cost Accounting*

All the costs that a utility incurs are recorded and reflected in prices.

- Operations and maintenance; Administration; Overhead; Financial costs (depreciation, debt servicing, etc.); Capital costs; Regulatory costs...

And sometimes...

- Soft costs
- Environmental externalities
Case Study 1: Capital Regional District
It is not just about the price going up …

In fact,

*the total spent need not necessarily increase*

BUT

*the pricing structure really matters …*
Price Elasticity of Demand

The responsiveness of the quantity demanded of a good or service to a change in its price

\[ E_{x_{1},p_{k}} = \frac{\partial x_{1}(p, w)}{\partial p_{k}} \cdot \frac{p_{k}}{x_{1}(p, w)} = \frac{\partial \log x_{1}(p, w)}{\partial \log p_{k}} \]
Setting the Rate: Some Factors to Consider

- Likely impact of price change on community
- Price structure currently in place
- Impact on existing business systems
- How you will go about communicating the change to residents
- The *marginal cost* of supplying water
Setting the Rate

Connection Charge

+ Variable (Per Unit) Charge

Total Bill
The Great Rate Debate

Uniform vs. Inclining Block Rates
Some Other Special Types of Rates

- Excess Use Rate
- Seasonal Surcharges
- Distance Rates
- Scarcity Rates
- Lifeline Block
Case Study 2: Seattle, Washington
Setting the Rate: The Key Factor

Does the price accurately inform consumers about the costs of their water use and provide a signal that is sufficient to affect their decision making?
4. Mitigating Potential Downsides
The “Top 3” Challenges

1. Impacts on Low Income Families
2. Revenue Stability
3. Political Resistance
Mitigating Impacts on Low Income Families

- Provide “lifeline blocks”
- Targeted rebates and giveaways
- Non-financial tools (e.g. education)
- In some cases, subsidize (e.g. through levy on very high consumption)

*Remember: all families get more control over their costs when price is linked to consumption*
Case Study 3: San Antonio, Texas
Water Supply And Sanitation Bills As A Share Of Disposable Income: Lowest Decile of Population

Average income of the lowest decile of the population

Revenue Stability

1. Use innovative pricing mechanisms (e.g. rolling average pricing)

2. Use of two part system (fixed and variable charges) can smooth revenue variability

3. Senior government support

4. Careful planning goes a long way (e.g. research on price elasticity, local conditions)
Political Resistance

- Often motivated by fear that there will be “winners and losers”
- Exacerbated by a long history of water underpricing in Canada
- Consistently deliver the key messages in carefully planned communication
The Key Messages

- This makes sense from both financial and environmental perspectives.
- The negative consequences for communities can be easily mitigated (e.g. impacts on low income families)
- Individuals and families can have greater control over their costs.
- The objective is to cover the full costs of providing water services and no more. Someone ultimately has to pay these costs.
- Revenue is reinvested in repairing aging infrastructure and protecting water sources - this is about investing in communities.
- Improved pricing provides a much stronger incentive to innovate.
- Many other places are successfully doing it.
5. How to Get There From Here
Key Steps on The Journey

1. Have a plan
2. Consider implications for billing systems
3. Get metered and charge by volume
4. Improve water use accounting
5. Fully account for expenditure
6. Consider starting with seasonal surcharges
7. Make it part of a complete program
8. Recruit the aid of senior government
Case Study 4: Guelph, Ontario

Photo: allencooper, Google Earth
The Key Role of Senior Government

- Provide guidelines, policies, model bylaws
  - e.g. asset management, full cost accounting, pricing structures
- Create facilitating policies at provincial and federal level
  - e.g. encouraging universal metering
- Facilitate development of contingency and stabilization funds
- Link infrastructure grants to conservation and utility financial stability
- Remove existing legislative barriers
  - e.g. that prevent retaining surpluses
Take the Long Term View

Moving forward will take careful planning, communication and consensus building within the organization and the broader community.

And don’t forget... conservation-oriented pricing makes sound sense from both economic and environmental points of view!
Remember: Pricing is just one tool in the toolbox

Pricing reform should be imbedded in broader, holistic organizational reform and demand management efforts
Many more resources and tools are available from

- The POLIS Water Sustainability Project
- RDN’s team watersmart website
- waterbucket.ca

http://www.waterbucket.ca/
http://poliswaterproject.org/toolkit
http://www.rdn.bc.ca/cms.asp?wpID=842
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Thanks to Our Project Partners:
Questions?