



The Venezuelan Experience: Successful Tariff Structure in Caracas 1993-1999

Special GWP Seminar
in Water Pricing
Stockholm August 1999

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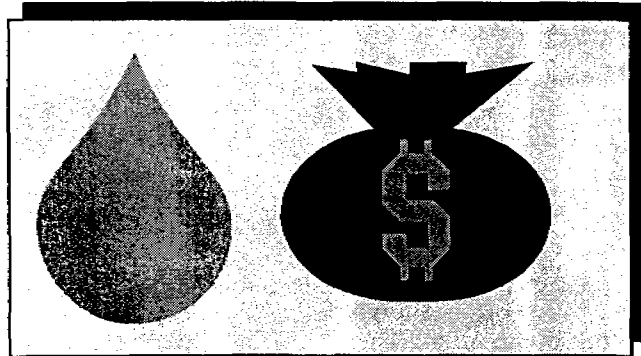
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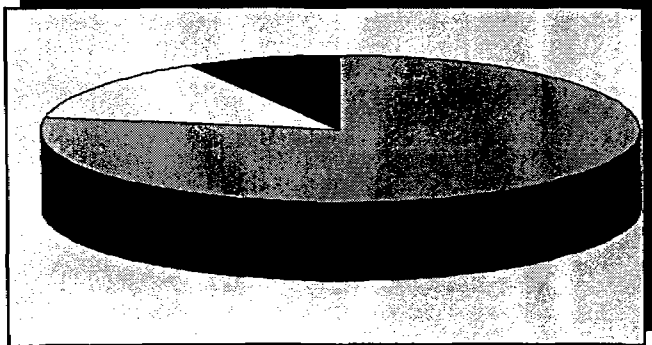
Table of Contents



Caracas' Water Utility



Water Rate

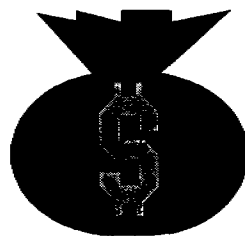
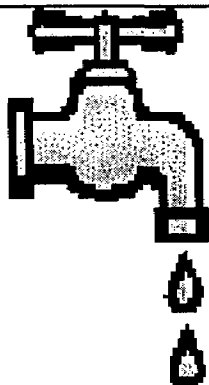
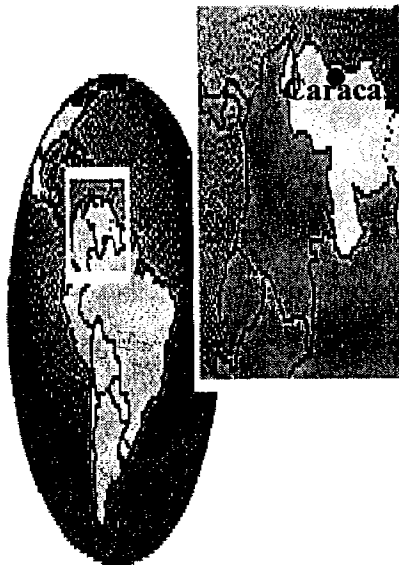


Analysis of Results

Hidrocapital - Characteristics of the water utility

Hidrocapital is the water utility serving 3.5 million people in Caracas and 1.0 million people the metropolitan area.

Venezuela

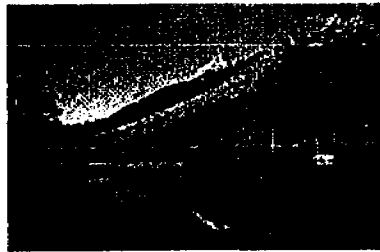


<i>Population Served</i> <i>Total Dwelling Units</i> <i>In 10 K Buildings</i> <i>In Residential Units</i> <i>In Social Units</i> <i>In Illegal & Informal</i>	<i>3.5 Million in Caracas</i> <i>685 Thousand</i> <i>260 K</i> <i>132 K</i> <i>43 K</i> <i>250 K</i>
<i>Number of connections</i>	<i>206 Thousand Registered</i> <i>250 Thousand Illegal</i>
<i>Water Production Capacity</i> <i>Water Delivery</i>	<i>505 Hm³/Yr in 1998</i> <i>25.000 liters per second</i> <i>415 liters per capita per day</i>
<i>Water Sales</i> <i>Billing/Production</i> <i>Collection/Billing</i>	<i>232 Hm³/ Yr in 1998</i> <i>46%</i> <i>85%</i>

Hidrocapital - Characteristics of the water utility

Hidrocapital's system is large, complex and expensive to operate and maintain

Production

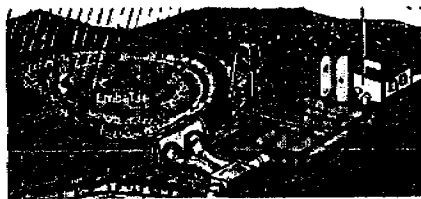


6 Reservoirs
13 Major Pumping Stations
50 Wells in the city

1490 Hm³
500 MW

1.000 meters of elevation
180 Km of pipes up to 3m in diameter

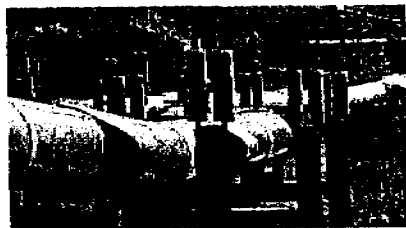
Treatment



3 Large Treatment plants
2 Small Treatment plants

25m³/sec

Distribution

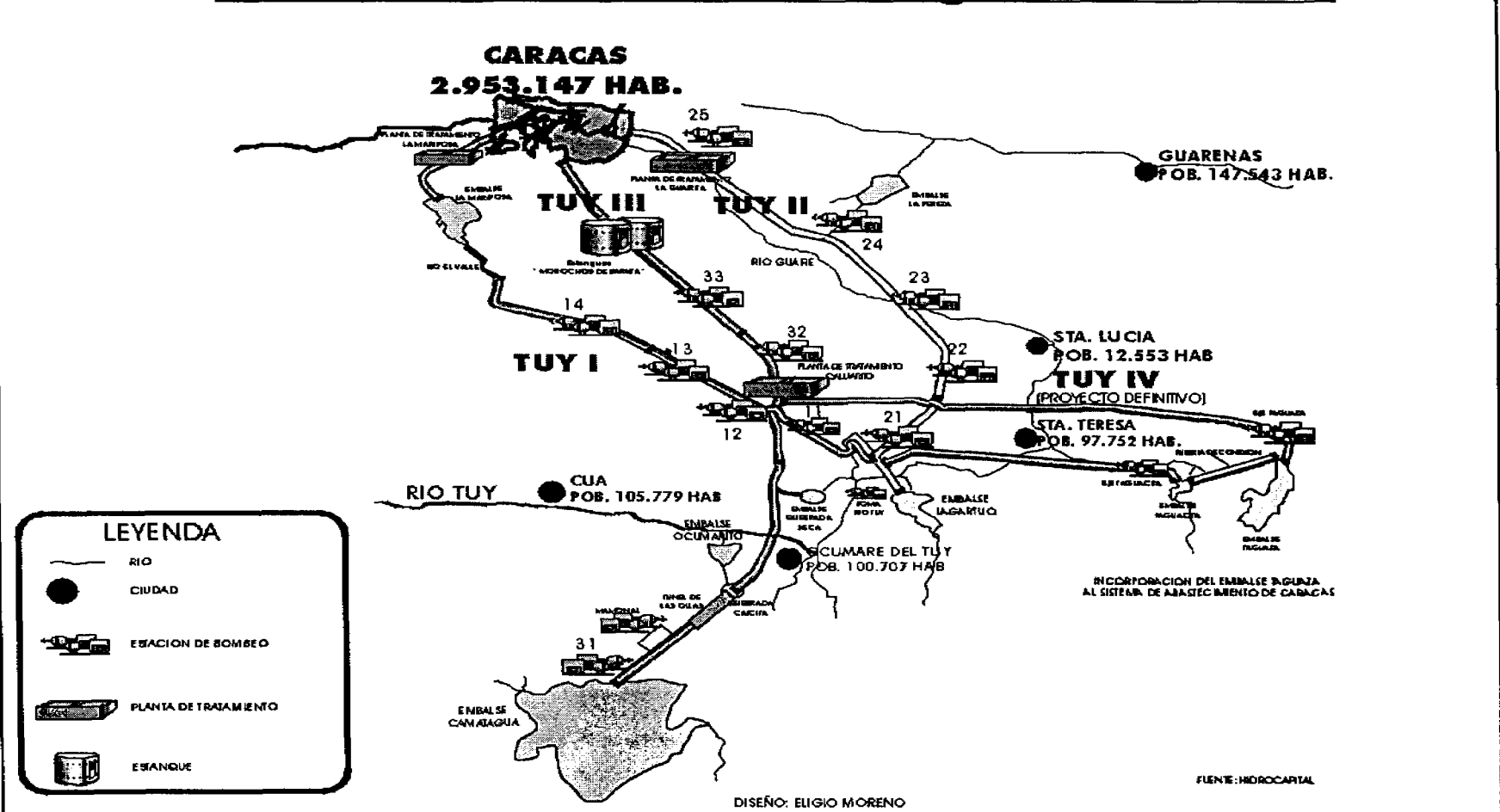


86 pumping stations in Caracas
2.500 Km of water pipes > 4"
2.000 Km of sewer and runoff pipes

The System is Complex



Sistema de Producción de Agua de Caracas



Hidrocapital - Characteristics of the water utility







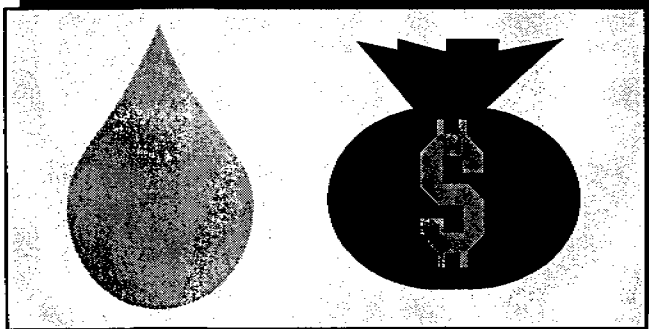
Type of Users	Number		Billing		Collection	
	# of clients x 1000	%	10 ⁶ m ³ /yr Billed	% Billed	10 ⁶ m ³ /yr Collected	% Collected /Billed
 Social	43	21%	16	7%	5	31%
 Residential	142	69%	140	60%	136	97%
 Industrial	3	1%	13	6%	13	100%
 Commercial	16	8%	46	20%	41	89%
 Governmental	2	1%	17	7%	2	12%
Sub Total	206	100%	232	100%	197	85%
 Illegal & informal	250	—	—	—	—	—

Table of Contents

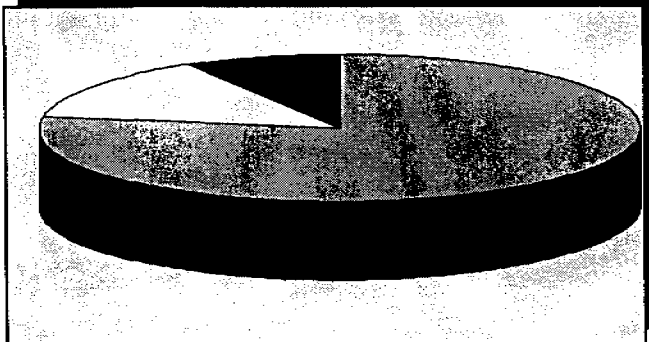


Caracas' Water Utility



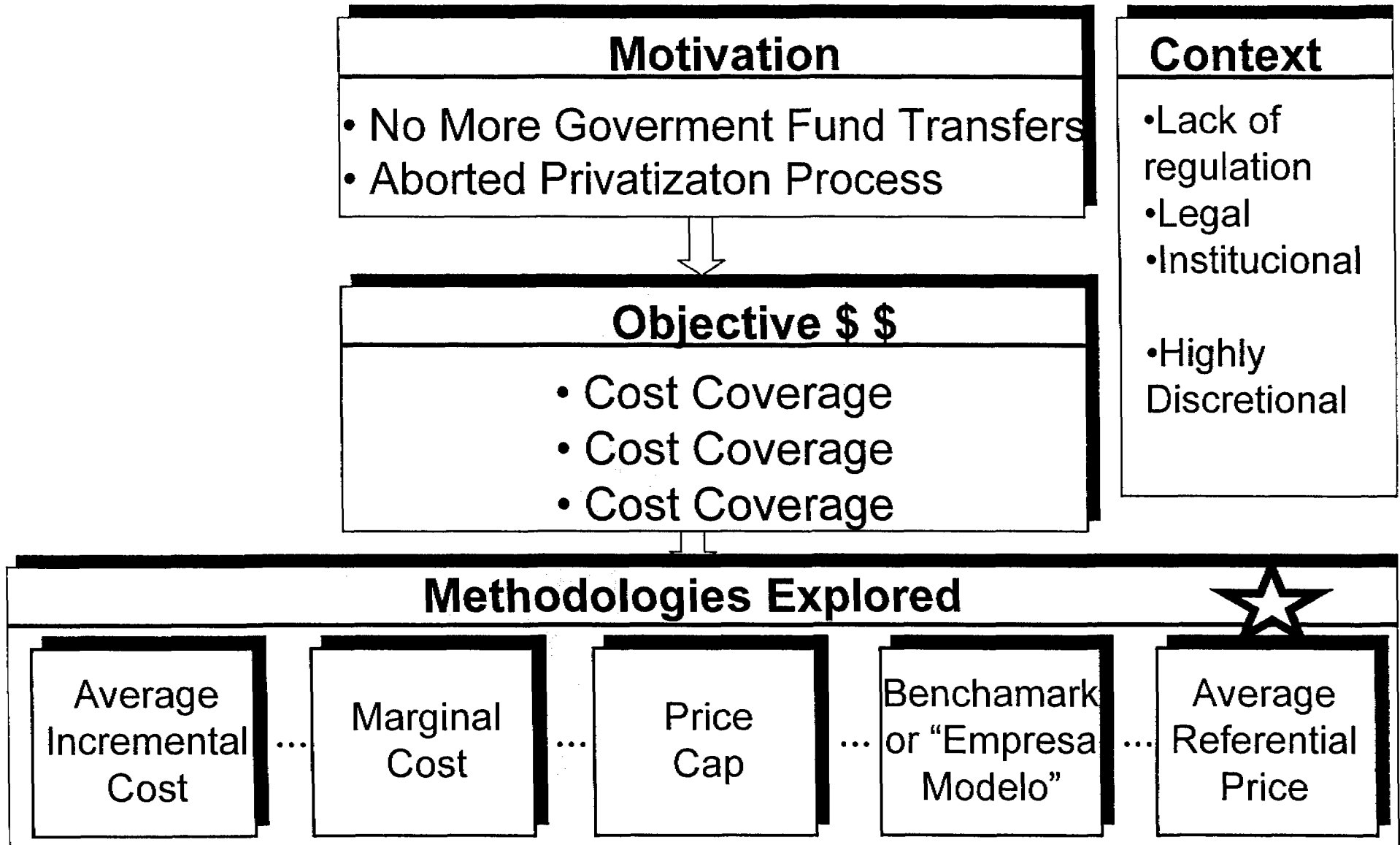
Water Rate

- Key features
- Tariff Structure
- Tariff Increases
- Variations
- Rate Setting Procedure



Analysis of Results

Current Tariff Structure - Background



Current Tariff Structure - Key Features

Venezuela's current water tariff structure was put in place April 14th, 1993 (Gaceta Oficial N° 35.190)

Key Features

$$\text{ARP} = \frac{\text{Cost}}{\text{m}^3}$$

1) Two parameters set the rate

ARP = Average Referential Price

ARPs = Average Referential Price for social users



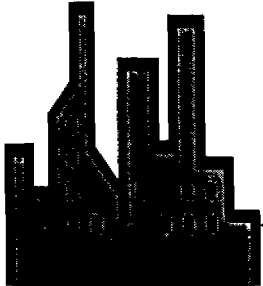

2) Cross Subsidies between users

3) Automatically indexed over time

ARP can change as a function of minimum wage, electric rate, cost of chemicals and the consumer price index

Current Tariff Structure - Coefficients

The coefficients provide discounts for social and residential sanitary uses (<15m³/month), penalize excess consumption and charge more for non residential usage

Type of Users	Minimum 15 m ³ /mo	Normal 16-40m ³ /mo	1 st Excess 41-100 m ³ /mo	2nd Excess >100m ³ /mo
 Social	0.5 ARPs	0.75 ARPs	1.5 ARP	2.0 ARP
 Residential	0.75 ARP	ARP	1.5 ARP	2.0 ARP
	Fixed Charge	Up to contracted "Dotación"	> Contracted "Dotación"	Dotación m3 /month contracted by the non residential user
 Ind A	1/6 dotación or 50m ³ /mo	2.05 ARP	3.25 ARP	
Ind B	1/6 dotación or 40m ³ /mo	1.7 ARP	2.7 ARP	
 Commercial	1/6 dotación or 30m ³ /mo	1.5 ARP	2.5 ARP	

Current Tariff Structure - Increases in ARP

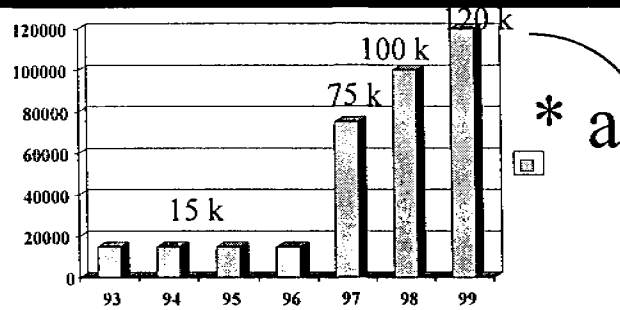
Rate increases are built into the Tariff resolution

$$ARP_n = ARP_i * \left[\begin{array}{l} a * \frac{\text{New Minimum Wage}}{\text{Initial Minimum Wage}} + \text{Icon 1} (17\%) \\ b * \frac{\text{New Average Cost of Energy}}{\text{Initial Avg. Cost of Energy}} + \text{Icon 2} (46\%) \\ c * \frac{\text{New Average Cost of Chemicals}}{\text{Initial Avg. Cost of Chemicals}} + \text{Icon 3} (5\%) \\ d * \frac{\text{New Consumer Price Index for construction}}{\text{Initial Consumer Price Index for construction}} + \text{Icon 4} (32\%) \end{array} \right]$$

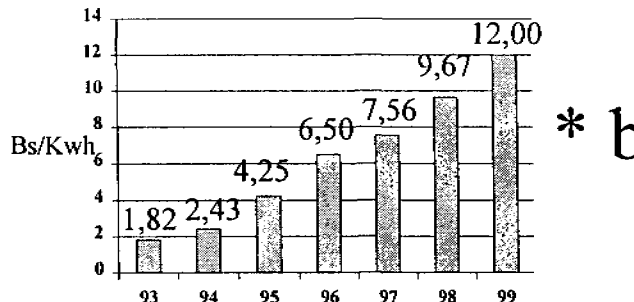
Where $a + b + c + d = 1.0$ and reflect the cost structure of the water utility

Current Tariff Structure - Increases in ARP

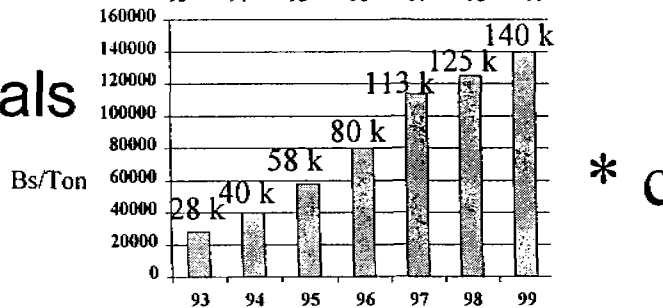
Minimum wage



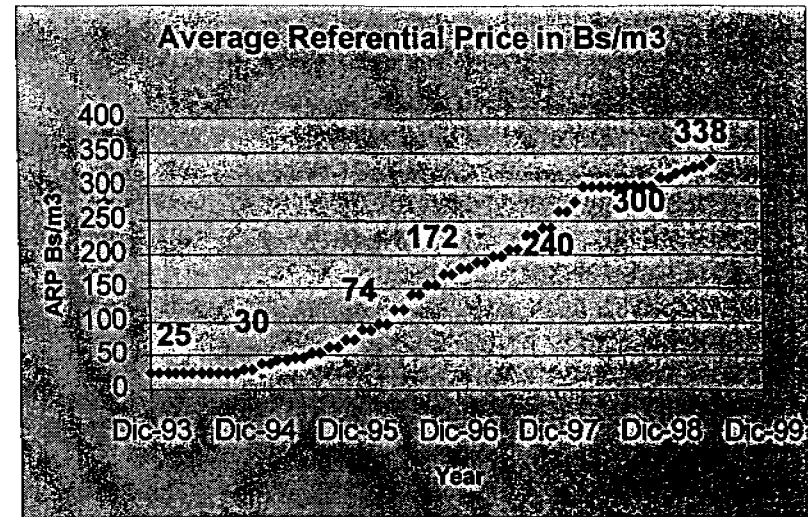
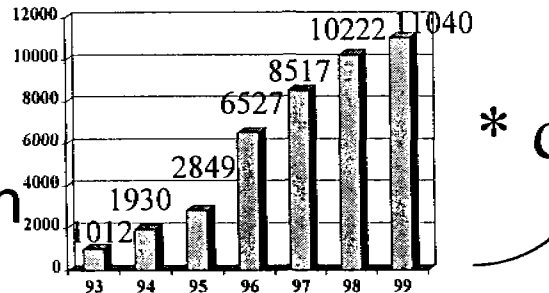
Energy Cost



Chemicals

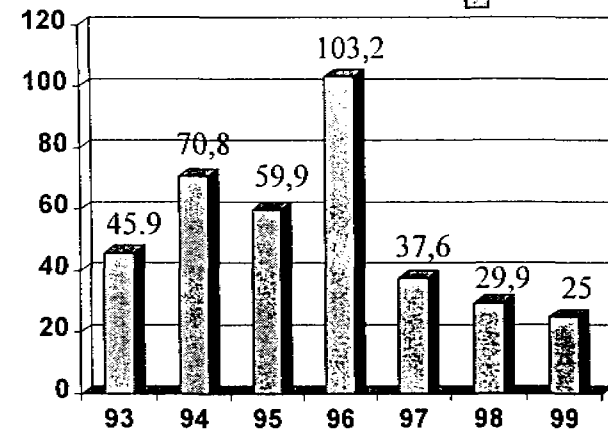


CPI in Construction



$$ARP_n = ARP_i * \text{factor}$$

Inflation



Current Tariff Structure - Variations

- **Different Acqueducts can use different ARP**

- f (cost of providing water service)
- f (population's ability to pay)
- f (population's willingness to pay - Management)
- f (composition of residential Vs non residential users)

$$\frac{\text{ARP} = \text{Cost}}{M^3}$$

- **When you don't read the meter... You estimate!**

- based on historic consumption
- based on regional studies
- based on given table e.g. For residential users

<i>Range</i>	<i>Single dwelling</i> <i>m³/mo</i>	<i>Multi dwelling</i> <i>m³/mo</i>
1	20	20
2	35	30
3	25	20
4	30	25
5	40	35
6	70	50

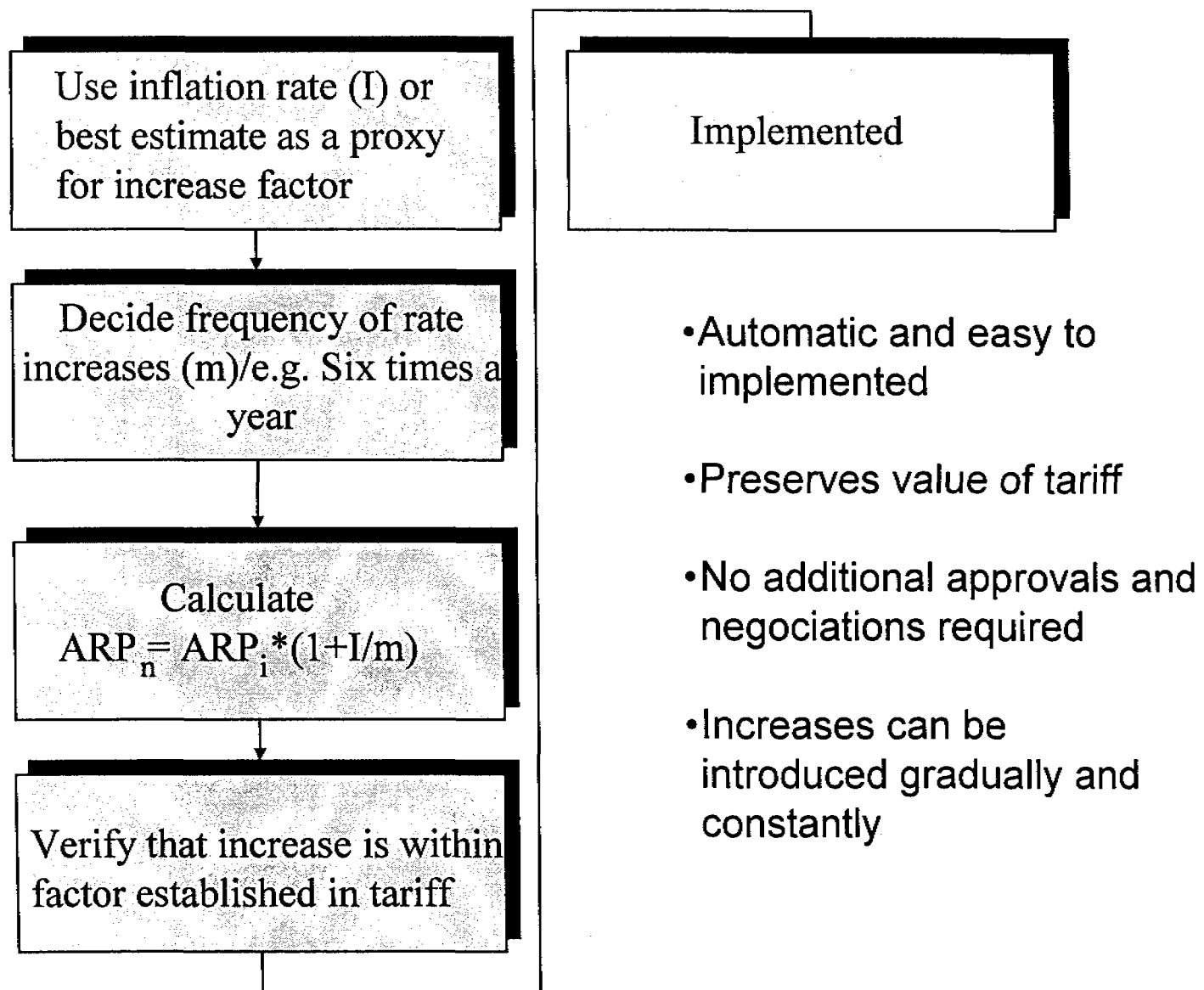
Rate setting Procedure

Prior to 1993



Rate setting Procedure

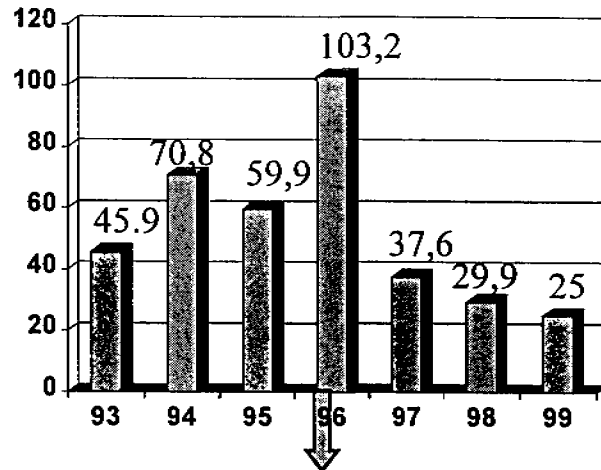
After 1993



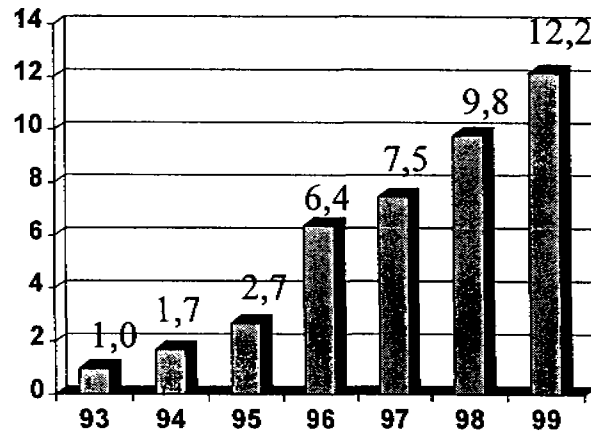
Rate setting Procedure

After 1993

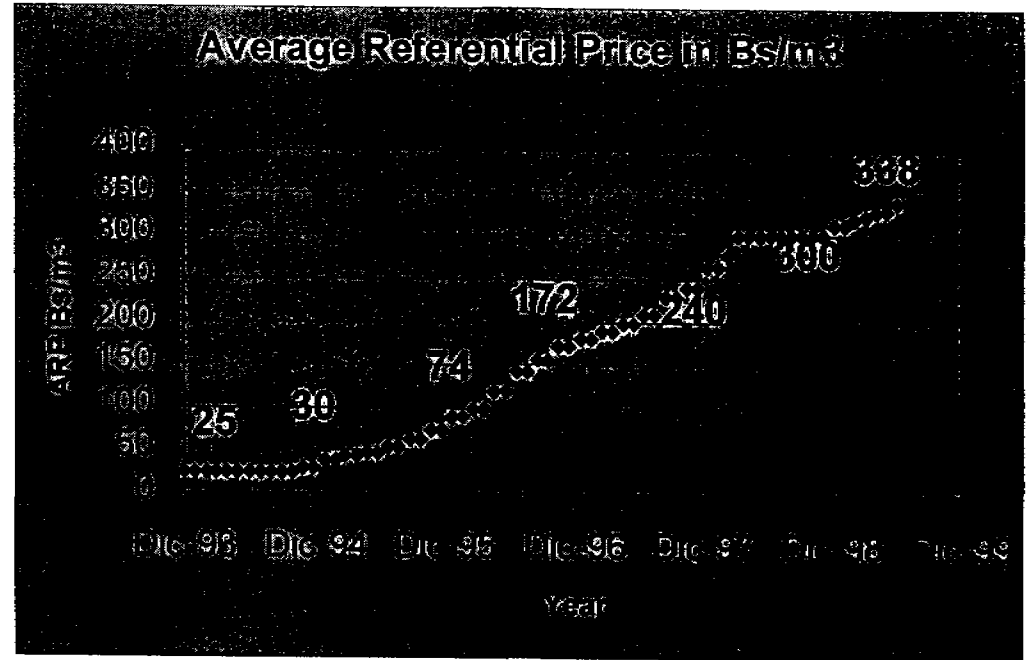
Inflation



Factor



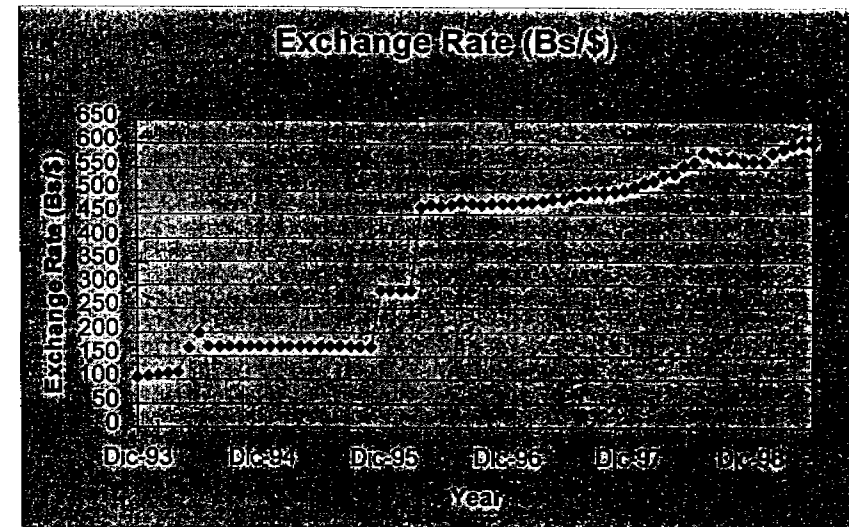
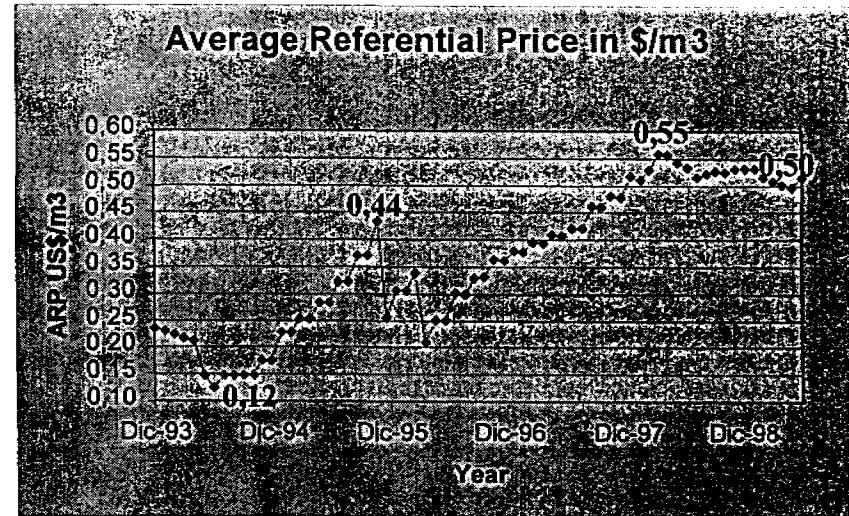
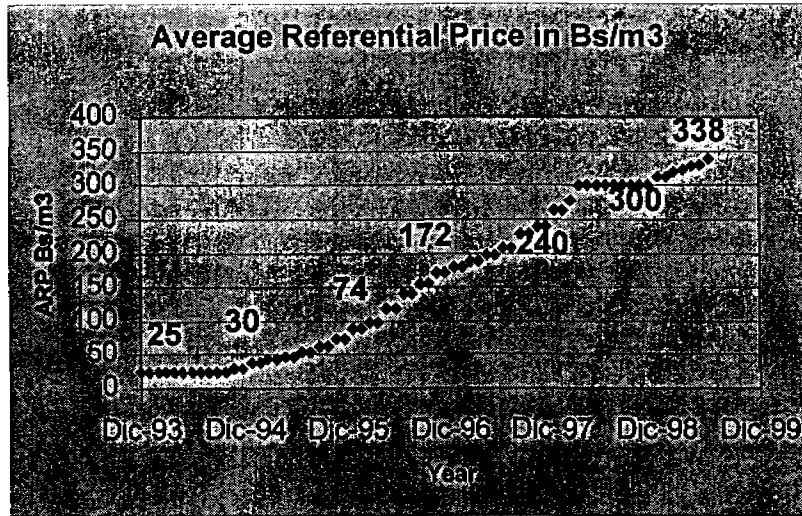
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$$ARP_n = ARP_i * \text{Factor}$$

Tariff Evolution

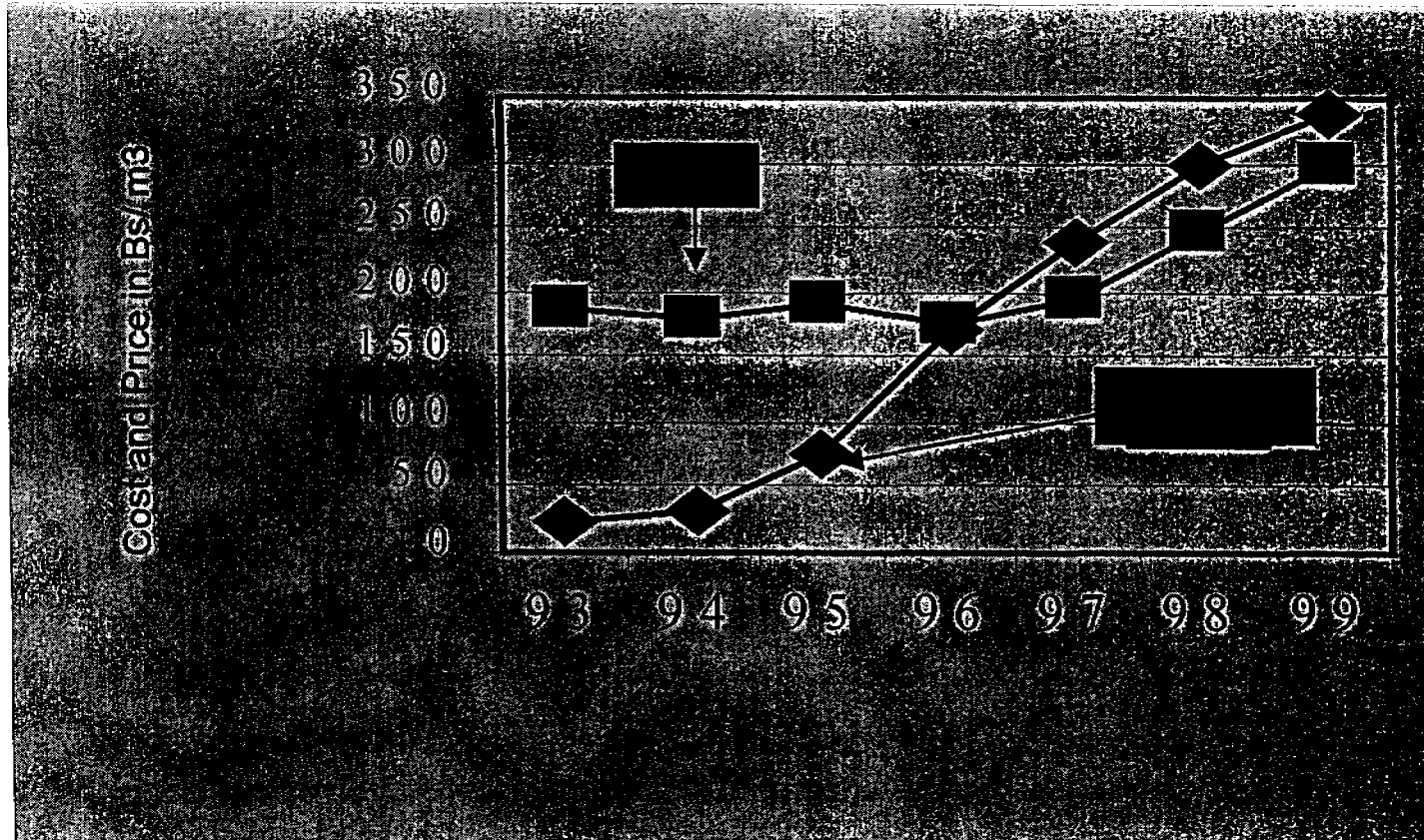
Price of water increased x13 in Bs/m³ and x 3.5 in \$/m³



Impact On Cost Coverage

The impact on cost coverage has been significant...

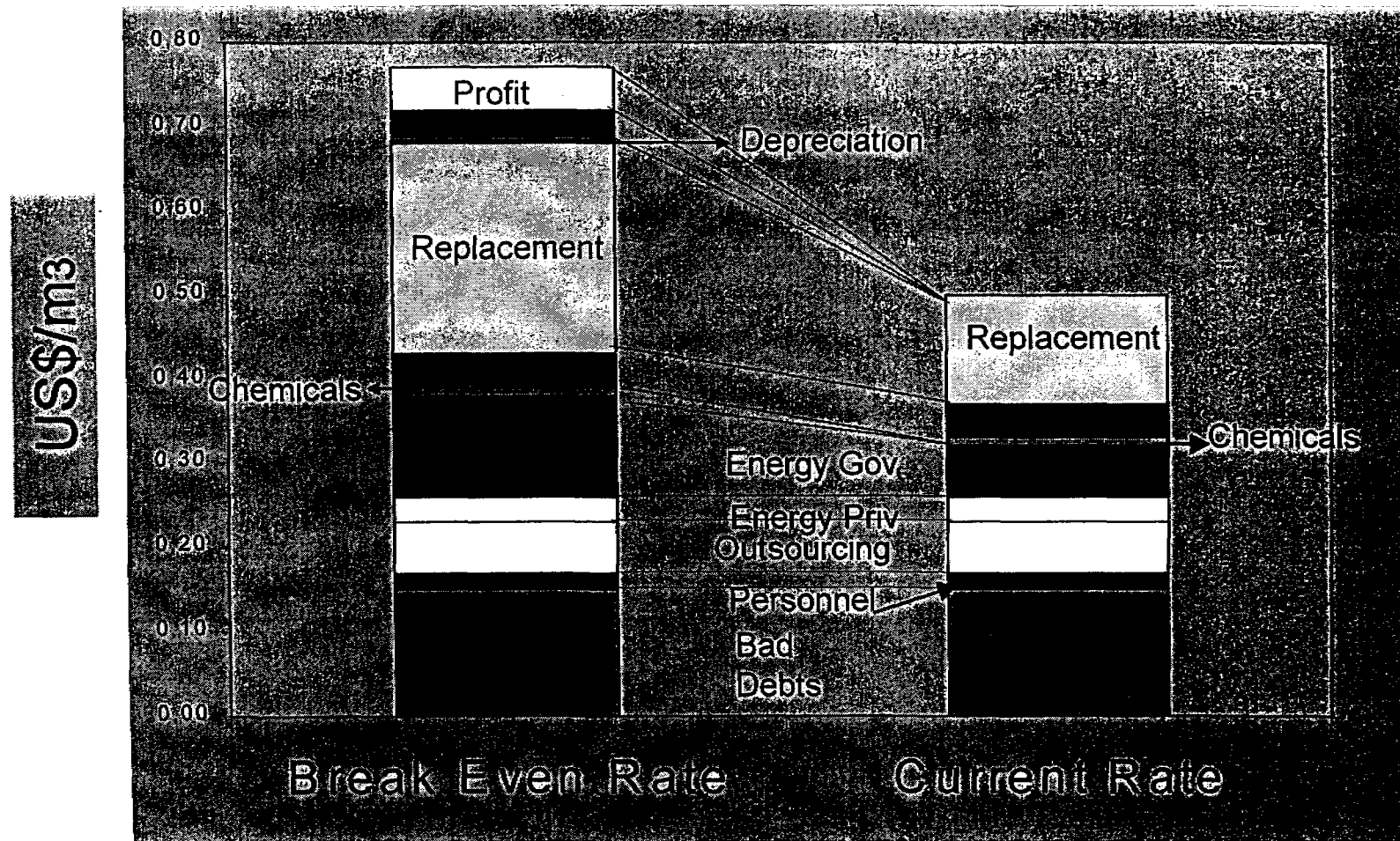
Unit Operation and Maintenance Costs and Average Referential Price in Bs/m³



Impact On cost Coverage

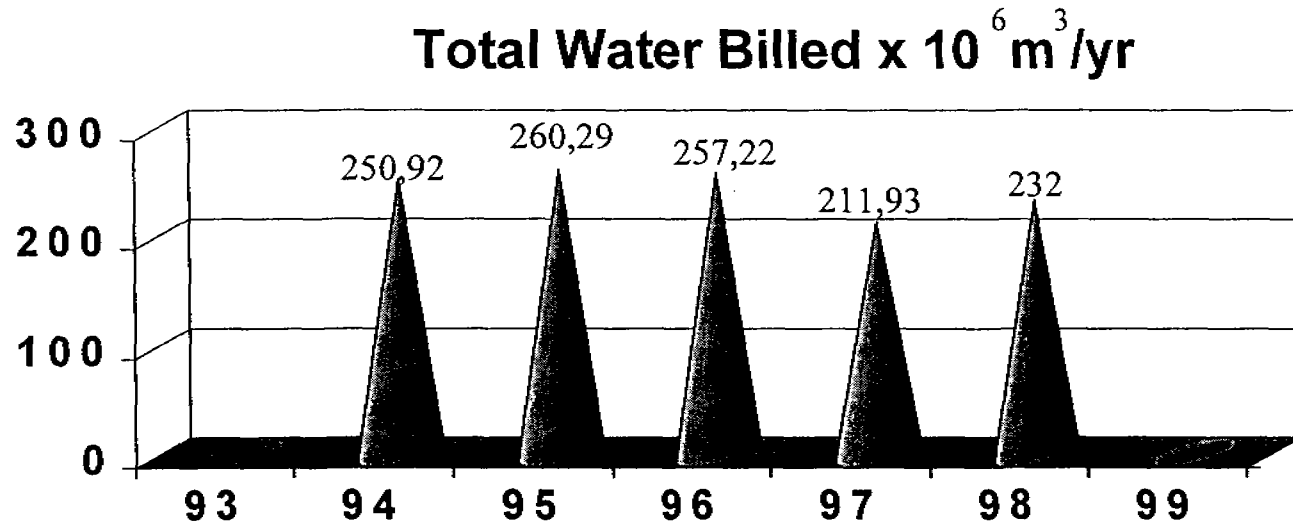
There is still a long way to go...

Comparing the break even rate with current rate



Impact on Consumption

Tariff increases have not changed total water billed



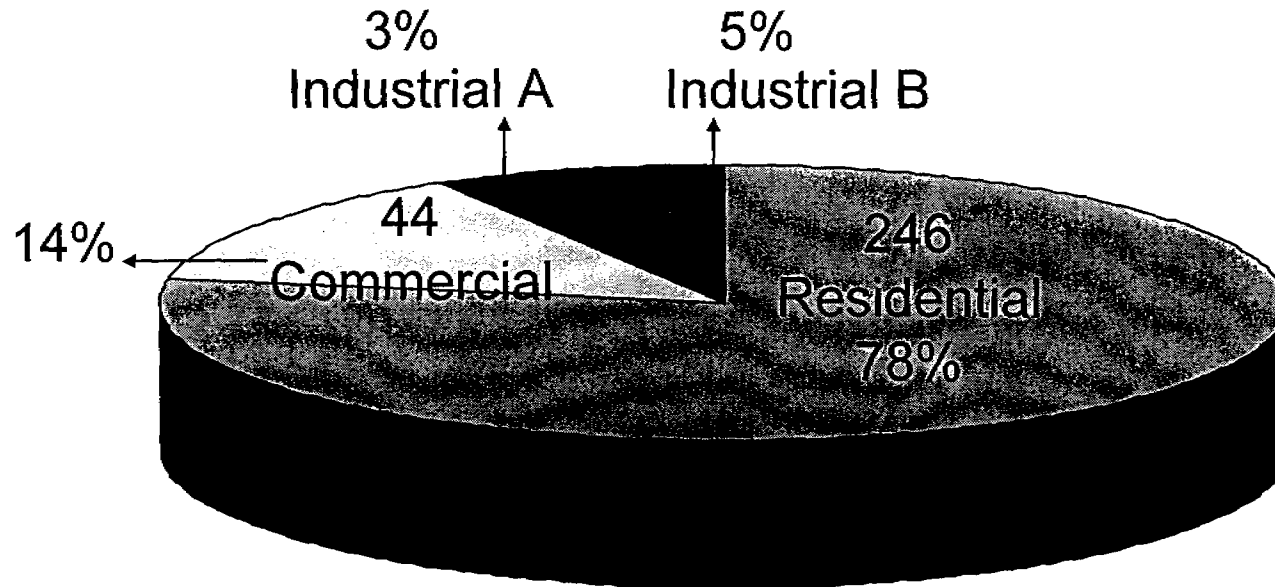
Notes

- Decrease in 1997 is due to severe drought conditions
- Over 80% of the water billed is estimated, no metered

Impact on Consumption - Sample Study

The sample consists of 316 clients with a reasonable record of metered consumption from 1993 to 1999

The distribution by type of use is:

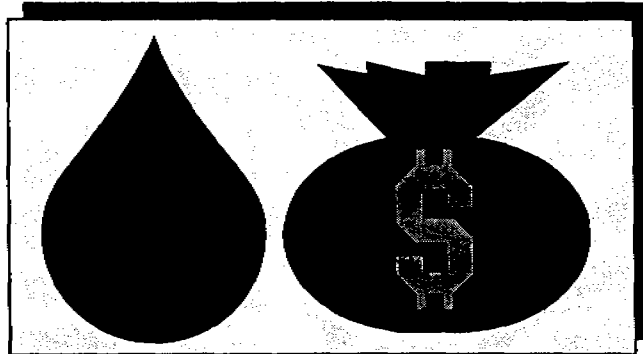


Total Clients = 316

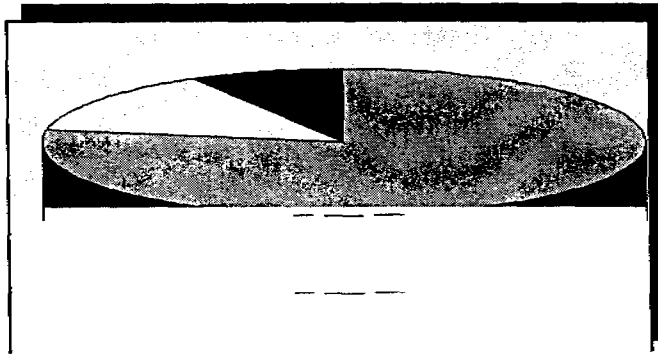
Table of Contents



Caracas' Water Utility



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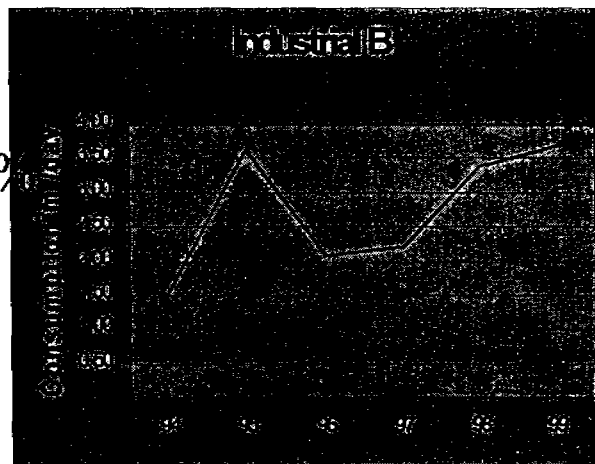
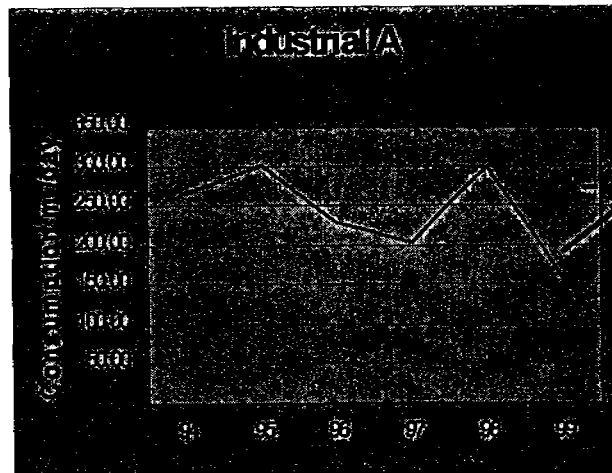
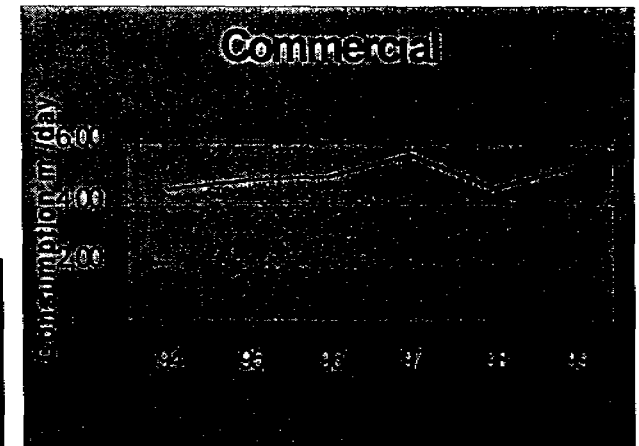
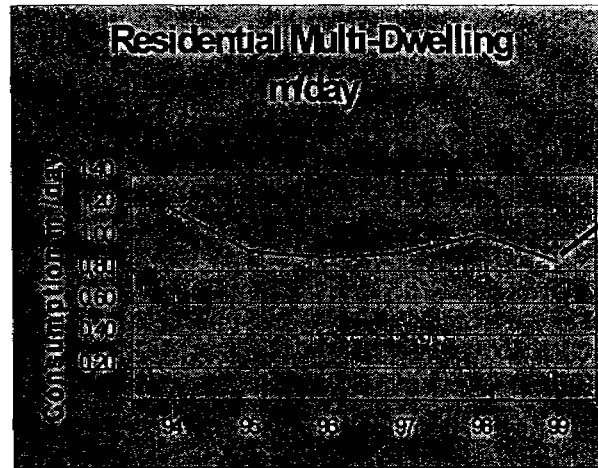
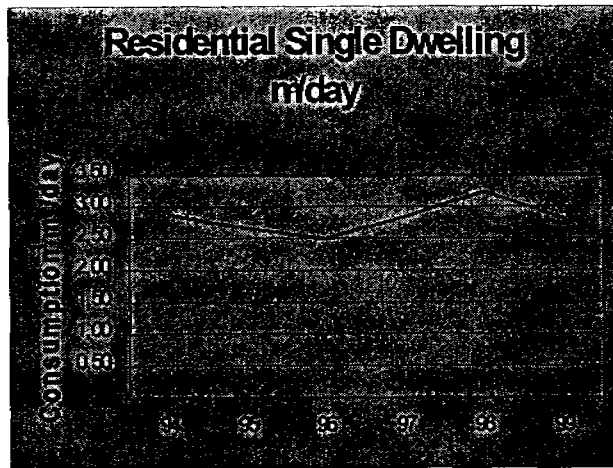


Analysis of Results

- Tariff evolution x 13 in Bs/m³
x 3.5 in \$/m³
- Impact on cost coverage – $\pi\pi$
- Impact on consumption $\rightarrow =$
- Regulatory vacuum

Impact on Consumption - Sample Results

Tariff increases have changed water consumption mainly in Multi-family dwellings and Industrial A



Advantages of a Regulatory Vacuum

The water sector in Venezuela has been enjoying a regulatory vacuum

Not Because of
lack of **laws and
regulations**



- Ley Orgánica de Administración Central
- Ley Orgánica de Régimen Municipal
- Ley de Protección al Consumidor
- Decreto 2.186
- Resolución tarifaria G.O 35.190

Regulation is via
Contract and Tariff
Resolutions

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Not Because of
lack of
Actors



- Central Government
MARNR, MF, MSAS,
CONGRESO.
- State Government
Alcaldías, Cámaras,
Mancomunidades
- Inos (R.I.P)
- Hidroven
- Hidro's
- Private Operators
- Clients
Jacobó Rubinstein

The vacuum is
due to



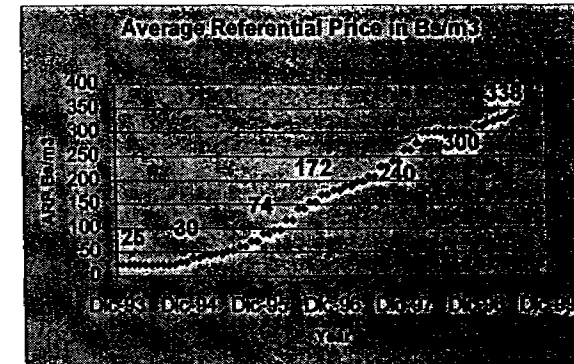
- Long transition
- Lack of clear direction and leadership
- Conflict of competencies
- Responsibilities are fragmented and dispersed
- Inefficiencies in price and subsidies
- Lack of penalties for non compliance
- Few incentives for private participation

Advantages of a Regulatory Vacuum

The advantages of the regulatory vacuum enjoyed from 1993 to 1999 include, among others, the following



Ability to increase
tariff x 13 in Bs/m³
x 3.5 in \$/m³



Ability to explore
different avenues of
private participation

- Concession (R.I.P)
- Technical Assistance
- Outsourcing
- Strategic Alliances
(?)



Low political
interference

- Prevalence of sound
technical criteria
- Flexibility and speedy
decision making
process

Disadvantages of a Regulatory Vacuum

There are important disadvantages associated with the regulatory vacuum

- **Unclear rules of the game**



- **Unclear responsibilities and accountability**

- Difficult to predict
- Highly discretionary
- Highly unstable
- Too risky to invest

- Lack of concern for efficiency, quality and cost of service
- No penalties for non compliance

Conclusion

- **Tariff increases in Caracas**
 - ΠHave improved the utility's financial condition
 - ΠHave not reduced consumption significantly
- **The regulatory vacuum made this tariff increase easier to accomplish**
 - ΠLack of Regulation was far better than inappropriate Regulation

Lessons Learned

1



Develop abilities to **manage customer's willingness to pay**

2

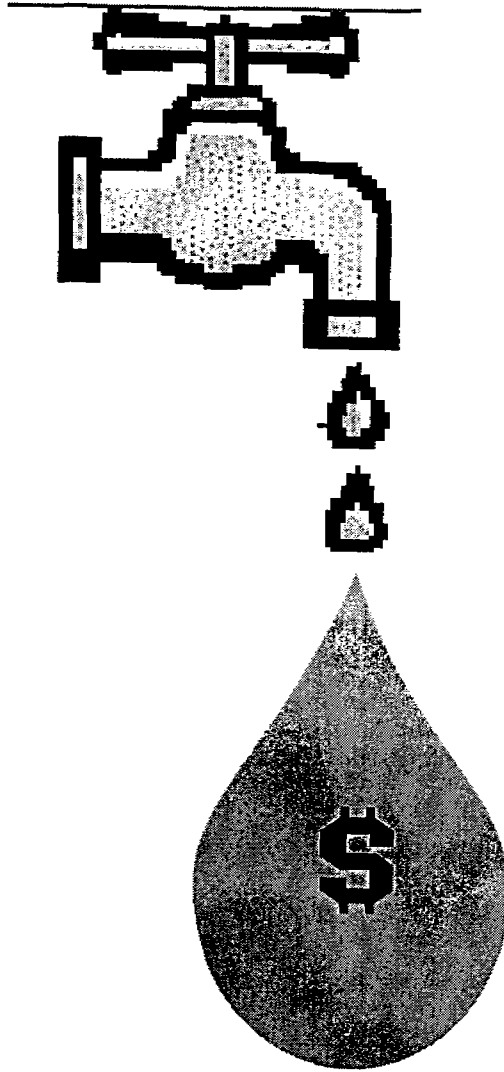


Incentives to improve efficiency must be forced in place to balance pure price increases

3



Automatic and clearly agreed upon rules are much more transparent and efficient than discretionary negotiation



Thank You!

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Jacobo Rubinstein