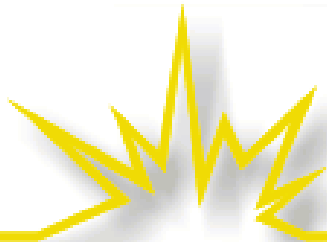


Embedded Costs & Rate Design

Tom Austin
October 1999



The Regulatory Assistance Project

50 State Street, Suite 3
Montpelier, Vermont USA 05602
Tel: 802.223.8199
Fax: 802.223.8172

Website:
<http://www.raonline.org>

177 Water Street
Gardiner, ME 04345-2149
Phone (207) 582-1135
Fax (207) 582-1176



Introduction

- Allocation Revenue Requirement among a utility's customers
- Most simple design
 - $\text{\$Rev Req} \div \text{Number of customers} = \text{Rate}$, billed annually, semi-annually or quarterly
 - Complexities arise due to desire to distinguish between
 - Types and amount of service
 - Types of customers



Purpose

- Based on groups of customers
 - Customer classes designated according to the criterion adopted (value, cost, social objectives)
 - Residential (with or without a low income or elderly segment)
 - Commercial
 - Industrial
 - Street lighting
 - Agricultural



Purpose

- Differentials based on the type of service
 - Variety of service offerings
 - Service varying by quality or time



Functionalize

- Energy
- Peak Demand
- Customers



Embedded Cost of Service

- Principle: Rates should reflect the average cost of providing service
- Qualifications
 - Costs should include all relevant costs, private and social
 - Costs should be reasonably or prudently incurred



Fully Allocated Embedded Costs

➤ Advantages:

- Actual costs
- Reconciled with the revenue requirement
- Perceived as Fair

➤ Disadvantages:

- Allocating joint and common costs
- Does not reflect current market trends
- May produce inefficient prices



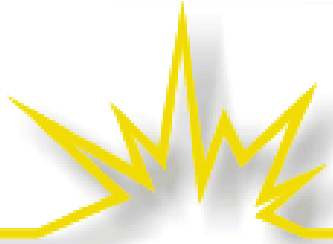
Embedded cost Steps

- Categorize
- Functionalize
- Allocate
 - kW
 - kWh
 - Customer



Categorize

- What are the costs of
 - Generation
 - Transmission
 - Distribution
 - Billing
- Need fairly detailed accounting for planning & rate design



Functionalizing Distribution

- Demand and customer related
- Minimum Size Approach
- Minimum System Approach



Functionalizing Generation

- Money spent to meet peak and energy needs at lowest cost
- Example
 - Opt. A \$20/kw/yr plus \$0.10/KWH
 - Opt. B \$100/kw/yr plus \$0.05/KWH
 - Build B for operation over 1600 hours
 - Demand -- all of Opt A capacity cost
 - 20% of Opt B cap. cost
 - Energy -- 80% of Opt B cap. cost
 - -- all KWH costs



Allocating Costs

- Include line losses
- Types of Demand Measures
 - Individual Peak
 - Class Peak
 - Coincident Peak
 - Annual
 - Monthly
 - Average and Excess



Joint and Common Costs

- Weakness of Embedded Costs
- Unallocable Costs
 - - Administrative and General Costs
- "Solutions"
 - Allocate in proportion to allocable
 - Do something reasonable
 - Consider other policy goals



Rate Averaging

- Within rate classes
- Across geographic areas: rural vs. urban
- Rate averaging vs. subsidy vs. simplicity