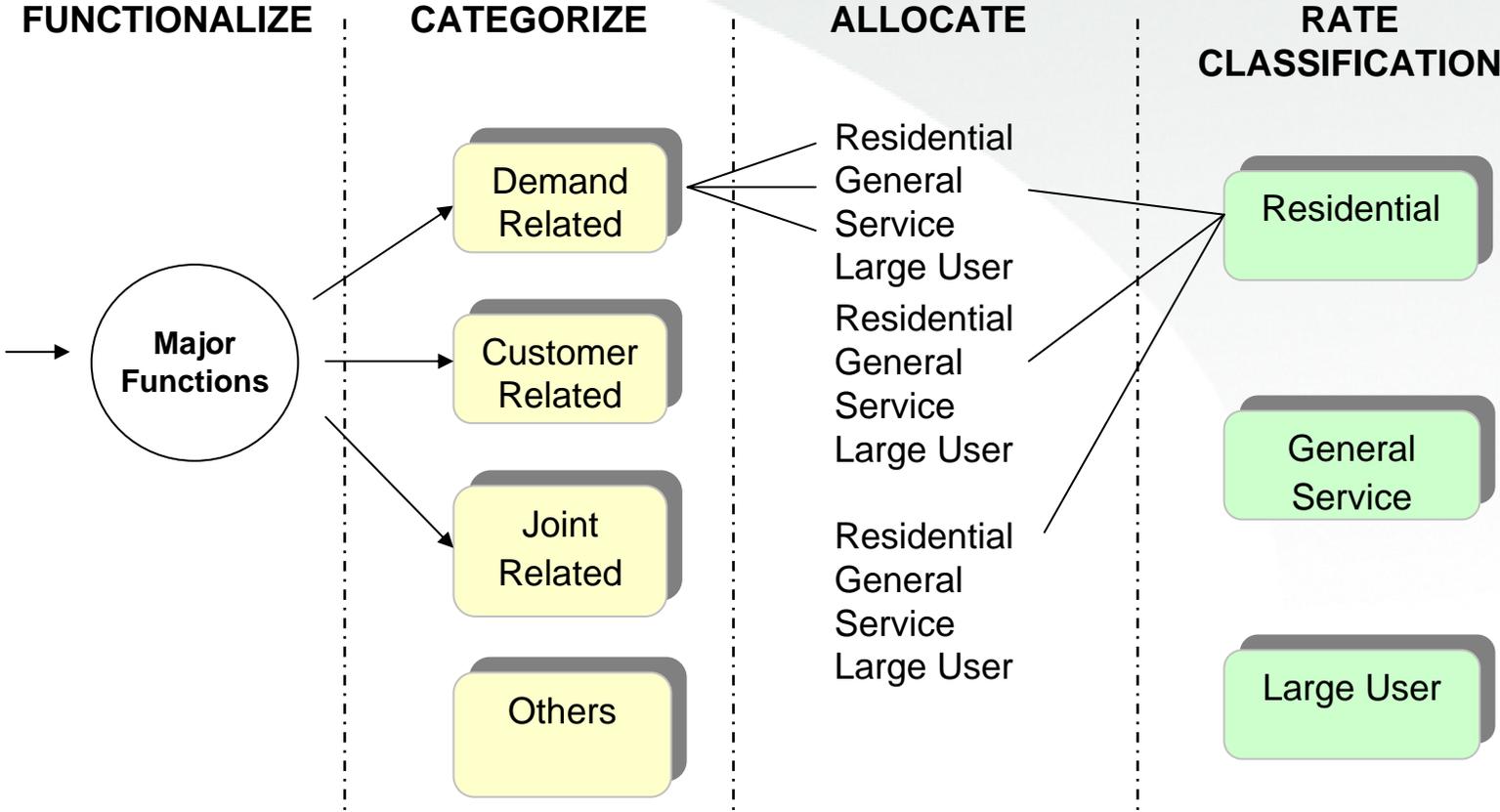# Ontario Energy Board

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Cost of Service Study 101

Anthony Lam, Toronto Hydro
Neil Yeung OEB Staff Consultant
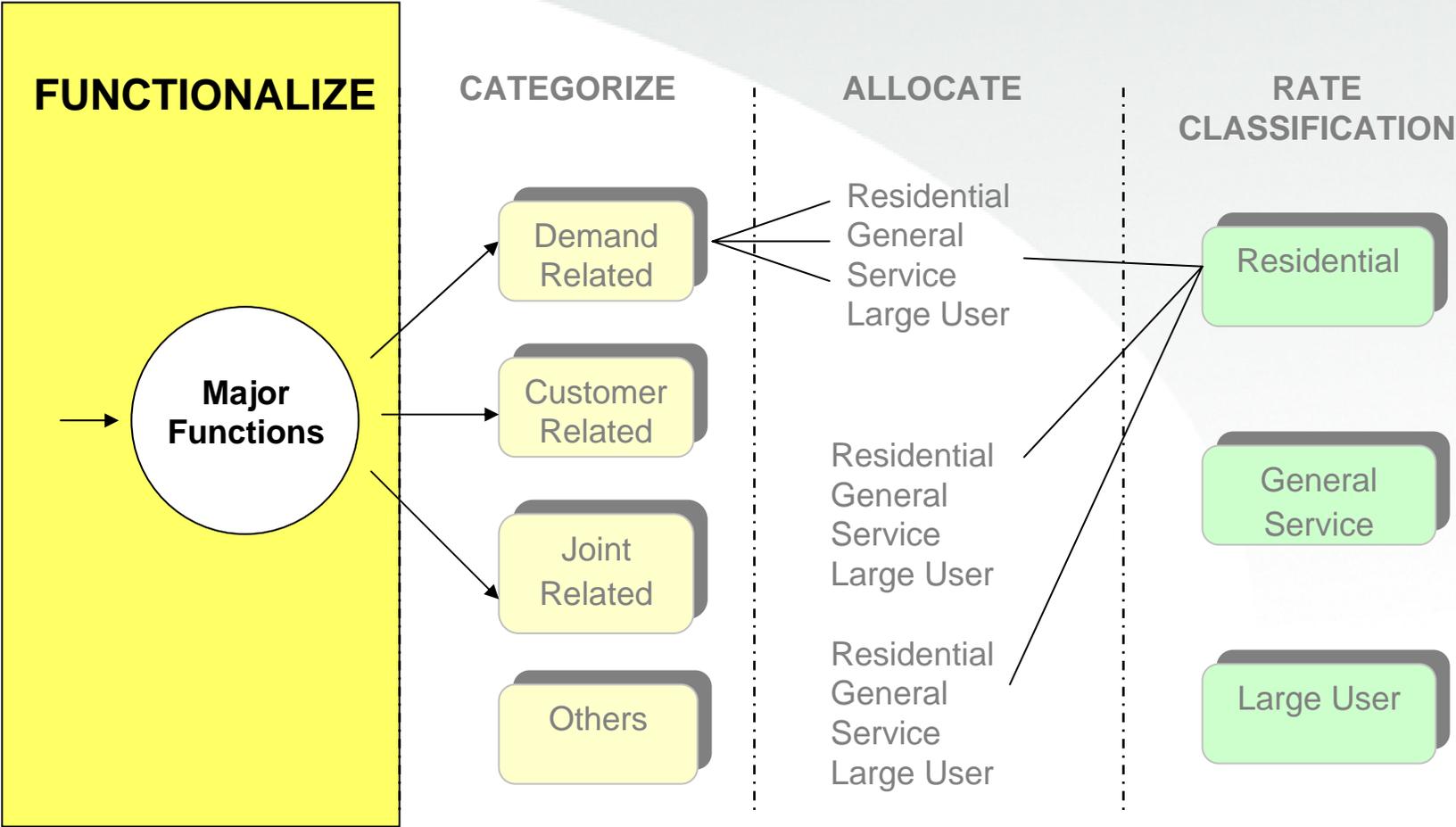
Overview of Major Steps in Cost of Service Study

TOTAL REVENUE REQUIREMENT

FUNCTIONALIZE	CATEGORIZE	ALLOCATE	RATE CLASSIFICATION

Major Functions

Demand Related

Customer Related

Joint Related

Others

Residential
General Service
Large User

Residential
General Service
Large User

Residential
General Service
Large User

Residential

General Service

Large User

Overview of Major Steps in Cost of Service Study

Functionalization

- Separate total expenses into functional components.
    - i.e. land buildings, line transformers, meters, general plant, billing and collection, administrative etc.

- Capital investments (assets) are also separated into functional components.

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Functionalization

USoA accounts

- EDR 2006 Trial Balance examples

Land and Buildings		
1805-2	Land Station <50 kV	Land and Buildings
1806-2	Land Rights Station <50 kV	Land and Buildings
1808-2	Buildings and Fixtures < 50 KV	Land and Buildings
1810-2	Leasehold Improvements <50 kV	Land and Buildings
1805	Land	Land and Buildings
1806	Land Rights	Land and Buildings
1808	Buildings and Fixtures	Land and Buildings
1810	Leasehold Improvements	Land and Buildings

- Again based on EDR 2006 Trial Balance examples
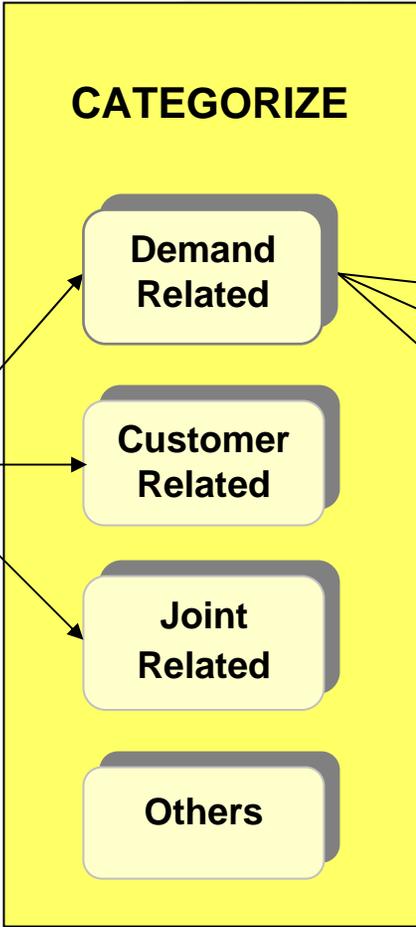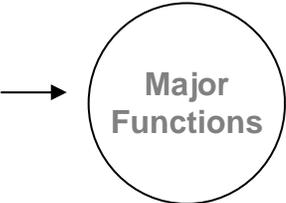
Poles, Wires		
1830-3	Poles, Towers and Fixtures - Subtransmission Bulk Delivery	Poles, Wires
1835-3	Overhead Conductors and Devices - Subtransmission Bulk Delivery	Poles, Wires
1840-3	Underground Conduit - Bulk Delivery	Poles, Wires
1845-3	Underground Conductors and Devices - Bulk Delivery	Poles, Wires

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Overview of Major Steps in Cost of Service Study

Categorization

Each functional component is reviewed to determine its <u>cost-causal</u> nature.

- Most components are driven by one or a combination of the following basic cost-causal elements
    - demand
    - number of customers
    - joint (both demand and customer)
    - others

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Categorization

- **Demand**
  - e.g. 1805-1 Land Station > 50kV

1805-1	Land Station >50 kV	Land and Buildings

- **Customer**
  - e.g. 1860 Meters`

1860	Meters	Services and Meters

- **Joint (Density base on Minimum System)**
  - e.g. 1830 Poles, Towers and Fixtures

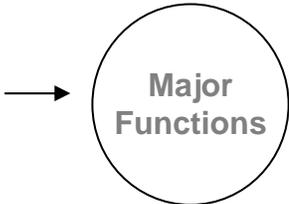| 1830	Poles, Towers and Fixtures	Poles, Wires

- **Other Cost Elements**
  - Pro-rated (Admin and General)
    - e.g. Misc. General Expenses
  - Direct Assignment
    - e.g. Water Heater Expenses/Street light expenses

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Overview of Major Steps in Cost of Service Study

TOTAL REVENUE REQUIREMENT

FUNCTIONALIZE

Major Functions

CATEGORIZE

- Demand Related
- Customer Related
- Joint Related
- Others

ALLOCATE

Residential
General
Service
Large User

Residential
General
Service
Large User

Residential
General
Service
Large User

RATE CLASSIFICATION

- Residential
- General Service
- Large User

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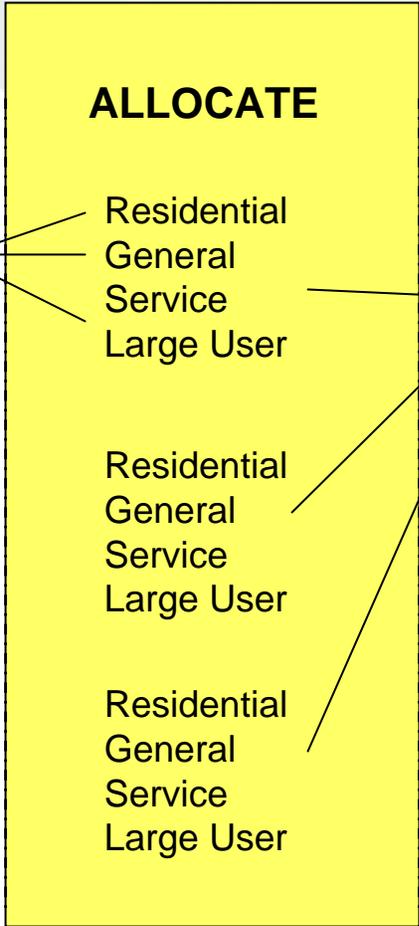
Allocation Factors

- After the expenses and assets are separated by demand, customer or joint, allocation factors are developed to allocate those costs to the various rate classes.
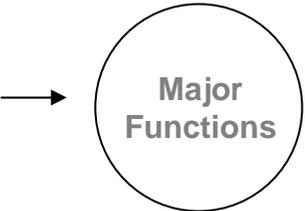
  Allocation Factors includes the following:

  - **For Demand**
    - Rate Class Coincident Peaks
    - Rate Class Non-Coincident Peaks
  - **For Customer**
    - Number of bills/customers/connections/meters readings
  - **Joint (Both Demand and Customer)**
    - Generally Minimum System Default (stratified by density); or
    - based on other related USoA accounts
  - **Others**
    - Corresponding Asset, Composite O&M or Composite Rate Base

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Overview of Major Steps in Cost of Service Study

TOTAL REVENUE REQUIREMENT

FUNCTIONALIZE | **CATEGORIZE** | **ALLOCATE** | **RATE CLASSIFICATION**

Major Functions →

- Demand Related
- Customer Related
- Joint Related
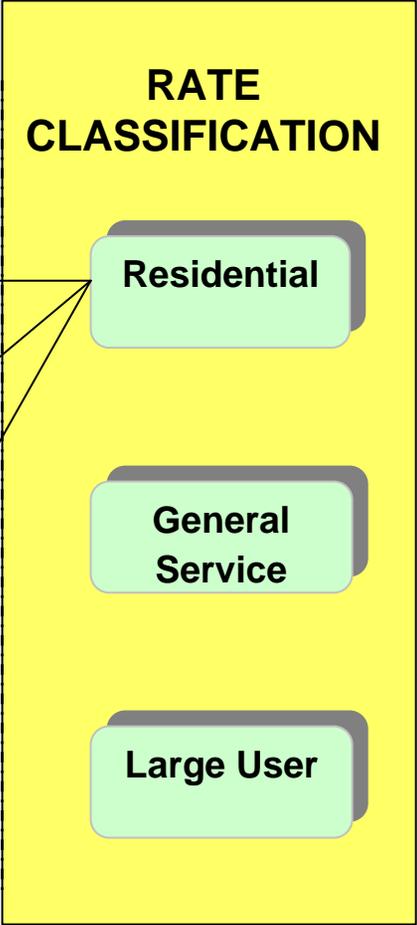- Others

Residential
General Service
Large User

Residential
General Service
Large User

Residential
General Service
Large User

Residential

General Service

Large User

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Output from Cost Allocation Model

Cost to Revenue Ratio:

- After all expenses and assets have been functionalized, categorized and allocated, the allocated expenses to each rate classes are summed and compared to the revenues from that rate class.
- This cost to revenue ratio provides an insight into the adequacy of the current rates to recover costs for each of the rate classes.
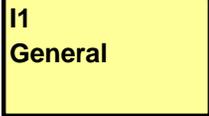
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- **Key Inputs:**
  - Trial Balance – Functions and Sub-functions
  - Customer Allocators – Billing Stats, Meter and customer data
  - Demand Allocators – Load Data, Line Loss, PLCC
- **Process:**
  - Default Categorization Factors
  - Default Metering Stats
  - Table of Categorization, Allocation and Grouping
- **Key Outputs:**
  - Revenue to Cost Ratios and Rate of Return by Class
  - Summary and Detailed Allocation by USoA
  - Additional Outputs under Discussion with the Working Group
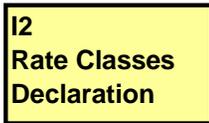
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1. GENERAL

I1
General

2. LDC INPUT - Rate Classes

I2
Rate Classes
Declaration

OEB Defaults

3. LDC INPUT - Financial Data

I3
Trial Balance **Data**

I4
Break Out Assets

Load Shapes
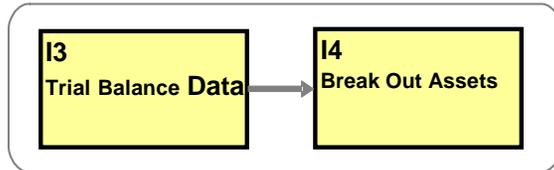
4. LDC INPUT - Customer Data and Operating Stats

I5 Rate **Class Stats**	I6.1 Meter Capital	I6.2 Meter Reading	I7 kW Allocators	I8 Misc. Data	I9 Class **Add/Delete**

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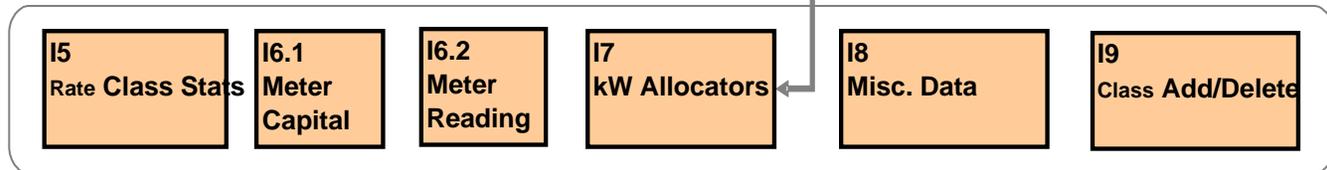
5. MODEL PROCESS - Categorization - OEB Defaults

E1
Categorization

6. MODEL PROCESS - Allocators calculated from 4.

E2
Allocators

7. MODEL PROCESS - Detail Cost Elements by Rate Class

E3
Trial Balance
Allocation Details

E4
Reconcilliation

8. MODEL OUTPUT- Summaries by Rate Class

O1	O2	O3	O4	O5	O6	O7
Rev - Cost Ratios	**Fixed Charges Floor & Ceiling**	**Transformer data**	**Class & Account Summary**	**Class & Account Details**	**Unit Cost**	**Summary Unit Cost**

O8	O9	O10	O11	O12	O13
Stand-by	**Update T&T Allowance**	**Cost by Functions**	**Others**	**Composite Allocators**	**Ammortization**

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