

Data Management



Agenda

- Sample Organization
- Groups
- Locations
- Data management
 - Data Types
 - Account Styles
 - Accounts
- Content Setup tools

A Sample Customer Organization

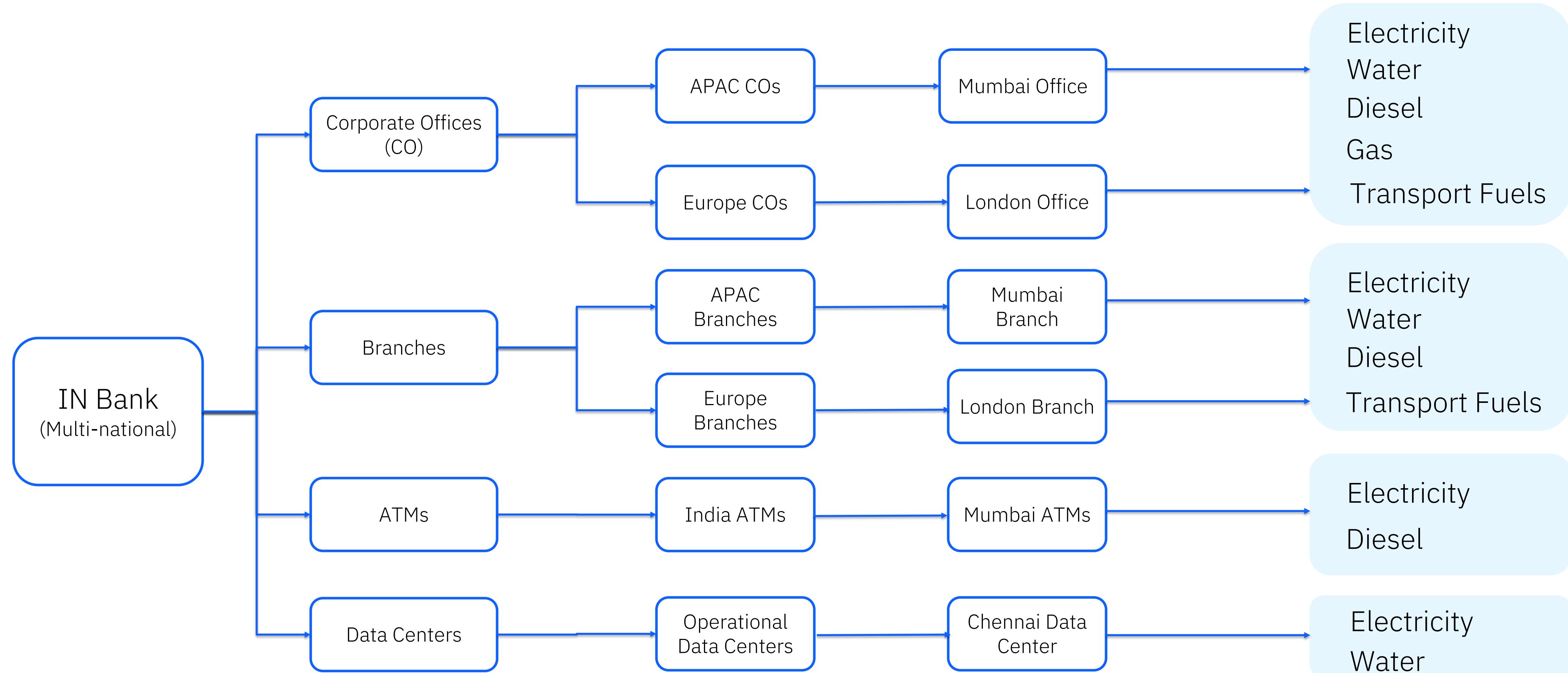
Let's take a Multinational Bank – IN Bank

- Head-office Mumbai, India
- Operates across globe
- Multiple corporate offices across regions
- Operates through branches, digital applications, etc.
- Various segments – deposits, housing loans, industry loans, etc
- Multiple data centers hosted across APAC, EMEA

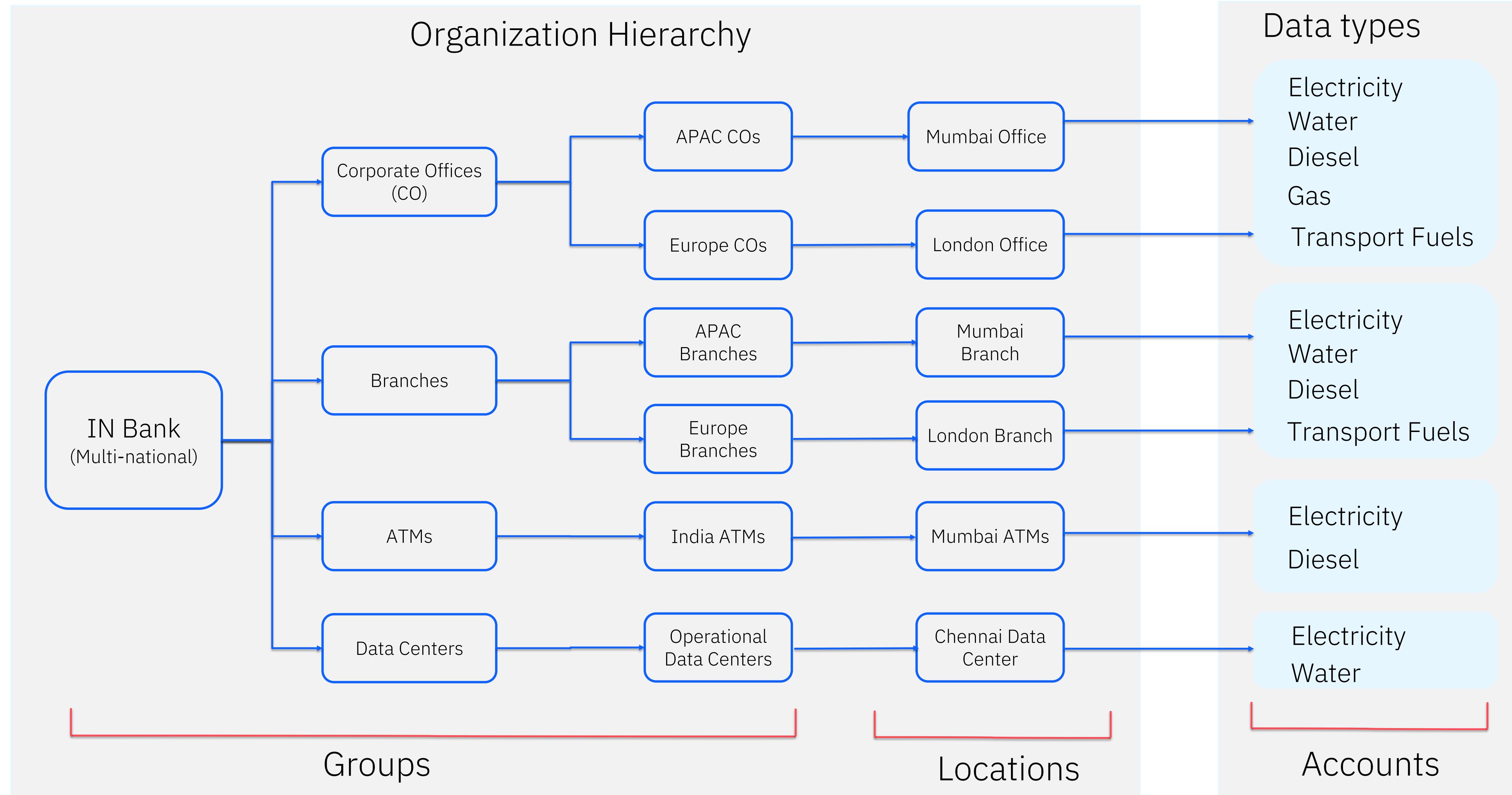
Net-zero Goals

- Reduce Scope 1, 2 by 80% by 2030
- 100% shift to Green Energy (Solar/Wind) by 2030
- Reduce finance for Fossil fuels industry by 90 % by 2035
- Responsible Financing
- Green loans
- Engage Suppliers on emission reductions
- Reporting needs – GRI, BRSR, TCFD

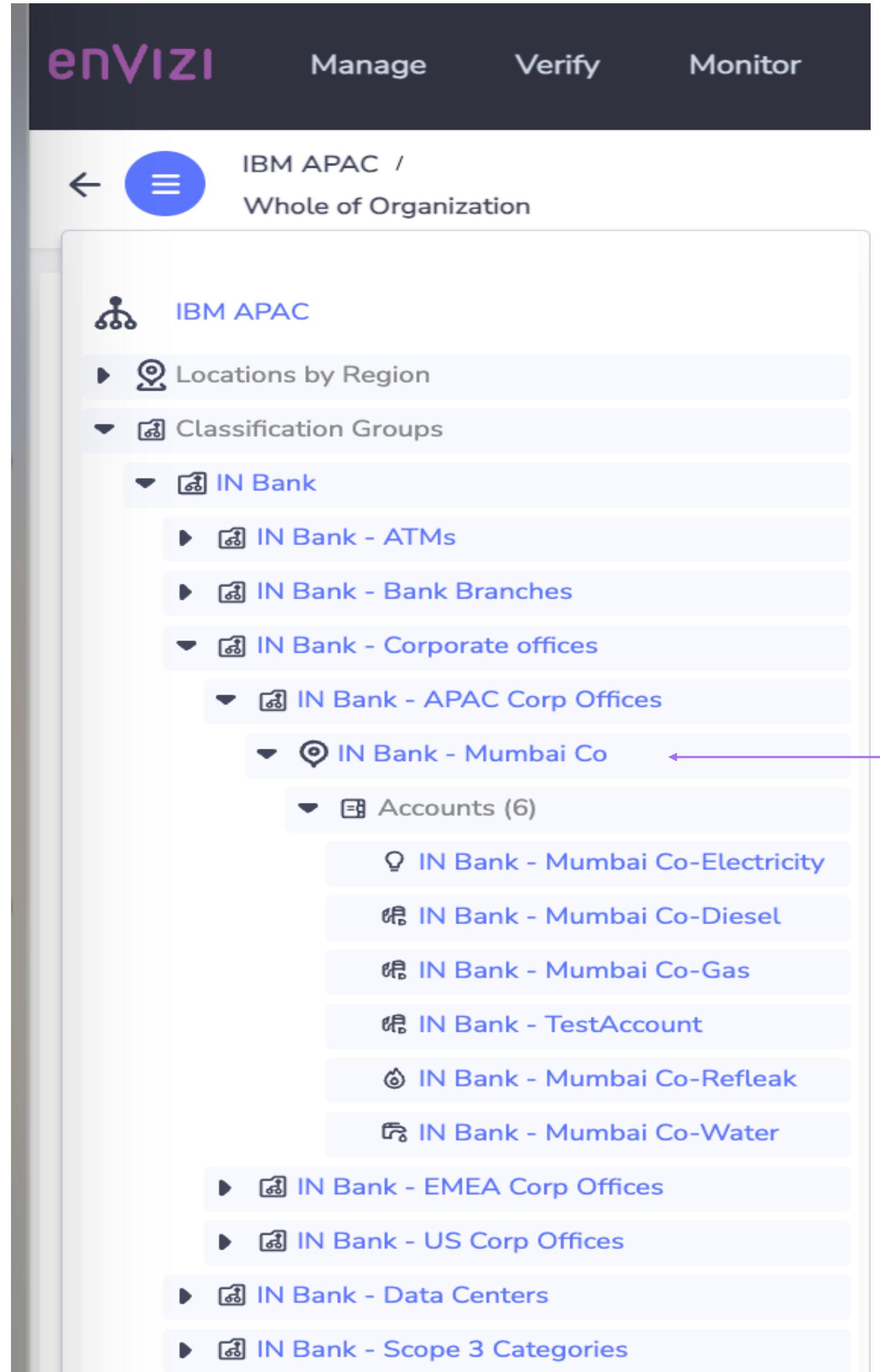
A Sample Customer Organization



A Sample Customer Organization



A Sample Customer Organization



Groups

Location

Accounts

Envizi Concepts - Locations

- Organization can have multiple locations.
- Buildings, properties, assets or sites and suppliers
- Attached to a group
- Represents physical address Ex: Country, Region, City, Street..
- Associate with latitude and longitude
- Location (Country / region) plays role in emission factor selection
- Collection of accounts – records data

Envizi Concepts - Groups

- Set of locations used for enterprise reporting
- Supports up to 3-level grouping structure
- 2 Types of Groups
 - Classification Groups
 - Portfolio Groups

Classification Groups:

- Key structure for enterprise reports and dashboards
- Each location must report 100%

Portfolio Groups:

- Represents secondary reporting structure

3-level grouping

▼ ⚙ Commercial Real Estate Group

▼ ⚙ Asset Type

▼ ⚙ Data Centers

▶ ⚙ Grand Central

▶ ⚙ Perrydale

▶ ⚙ Philadelphia

▶ ⚙ Healthcare

▶ ⚙ Logistics

▶ ⚙ Offices

2-level grouping

▼ 🏪 Retail Group

▼ 🏪 Logistics

▶ ⚙ Direct Fleet

▶ ⚙ Distribution Center

▶ ⚙ Hartford

▶ ⚙ Warehouse

▶ 🏪 Manufacturing

▶ 🏪 Office Space

1-level grouping

▼ 🏪 Business Group Canada

▶ ⚙ Banff

▶ ⚙ Blackhat USA

▶ ⚙ Gatineau

▶ ⚙ Hamilton

▶ ⚙ Mississauga

Data Management

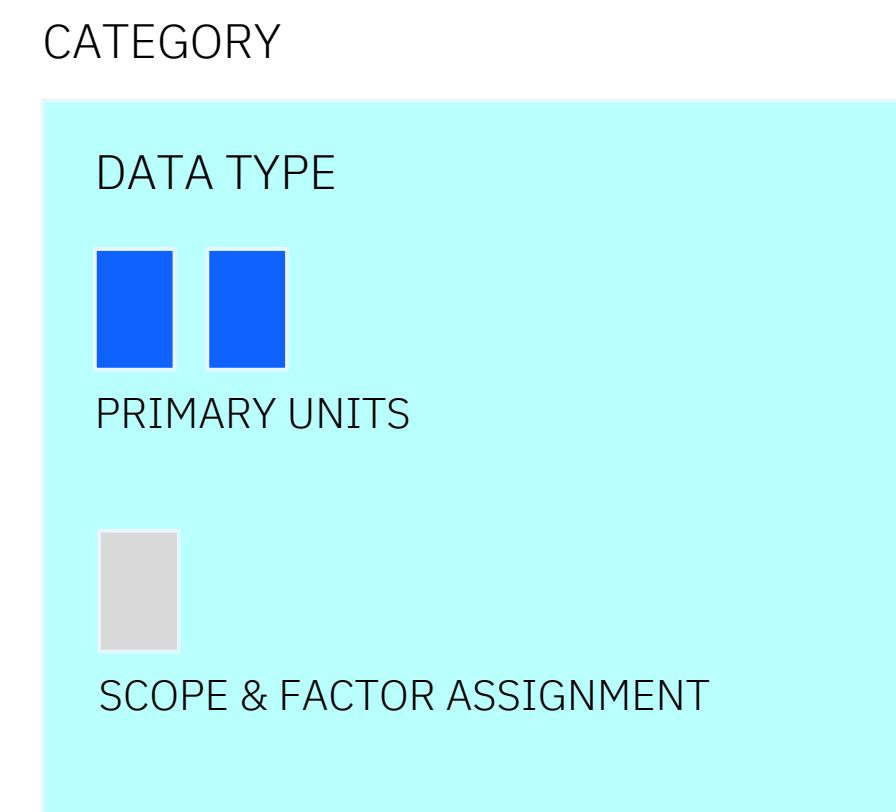
DATA TYPES

Configurable, but managed by envizi's product team

Defines:

- Data category to be managed (e.g Electricity)
- Primary unit of measure (cost and consumption)
- Emissions scope, and factor assignment process (if applicable)

There is an existing library (4,000+) that is constantly expanding to meet changing client requirements.



DATA TYPES

Example of Data Types for Electricity

Default Category	Name	Units	Scope
Electricity	Electricity [kWh]	kWh	Scope 2
Electricity	Electricity - Consumed (not combusted) [kWh]	kWh	Scope 1
Electricity	Electricity - Data and Cloud services [kWh]	kWh	Scope 3
Electricity	Electricity - Data and Cloud services [t CO2e]	t CO2e	Scope 3
Electricity	Electricity - Embedded Network [kWh]	kWh	Scope 2
Electricity	Electricity - IT Equipment [kWh]	kWh	Scope 2
Electricity	Electricity - LPO [kWh]	kWh	Scope 3
Electricity	Electricity - Offsite Renewables [kWh]	kWh	Scope 2
Electricity	Electricity - Onsite Renewables [kWh]	kWh	Scope 2
Electricity	Electricity - Onsite Renewables [MMBtu]	MMBtu	Scope 2
Electricity	Electricity - Purchased - Emissions [MWh]	MWh	Scope 2
Electricity	Electricity - Purchased [MMBtu]	MMBtu	Scope 2
Electricity	Electricity - Transmission and distribution [kWh]	kWh	Scope 3
Electricity	Electricity - Trigen [kWh]	kWh	Scope 2

CATEGORY

DATA TYPE



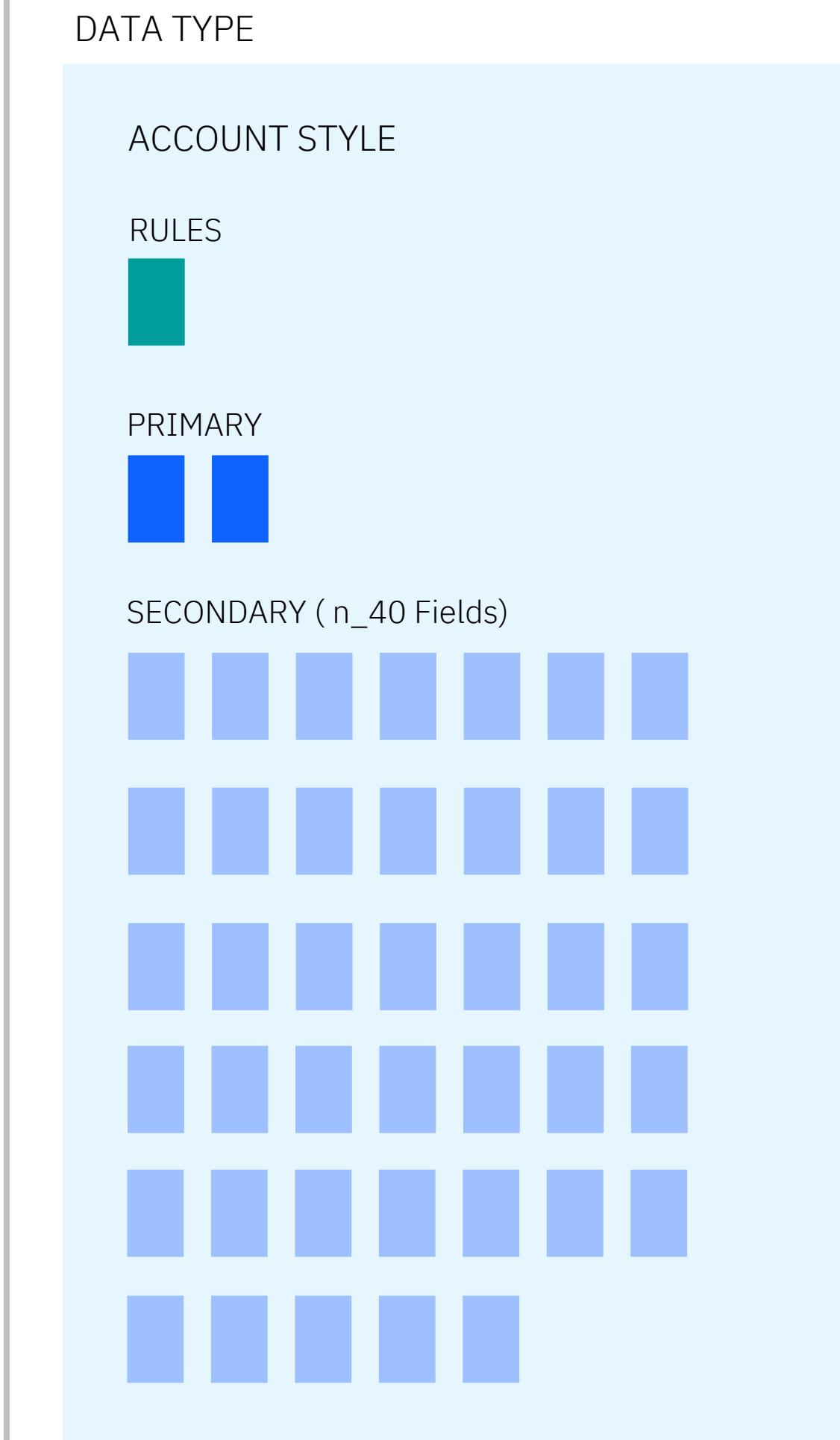
PRIMARY UNITS



SCOPE & FACTOR ASSIGNMENT

ACCOUNT STYLES

- Data schema configured on top of a [Data Type](#)
 - Configured [per customer](#) to provide flexibility to meet different data capture requirements
 - Defines the data fields to be captured (primary and secondary fields)
 - Can allow for drop-downs to be added to support things like multi-unit data capture, currency pick-lists, etc.
 - Supports rules, e.g:
 - Make certain fields mandatory
 - Provide default values
 - Perform simple math on input



ACCOUNT STYLES

Different Account styles for data type Electricity [kWh]

Capture Data

Account: ELEC_41011675 - Origin

* Start Period: 3/1/2023

* End Period: 3/31/2023

Reference:

Total KWh:

Maximum Demand KVA:

KWh Cost:

KVA Demand Cost:

Cost Other:

Tax:

Total Cost:

File: Choose File No file chosen

Data Is: Actual

CANCEL SAVE

PRIMARY FIELD (CONSUMPTION)

SECONDARY FIELDS

PRIMARY FIELD (COST)

Capture Data

Used for accounts in deregulated markets to store the data from the electricity distributor. Note that both the cost and consumption data stored in these accounts is reported.

Account: 9239_E -

* Start Period: 4/1/2023

* End Period: 5/31/2023

Reference:

Total kWh:

Peak kWh:

Off Peak kWh:

Int kWh:

Total Cost:

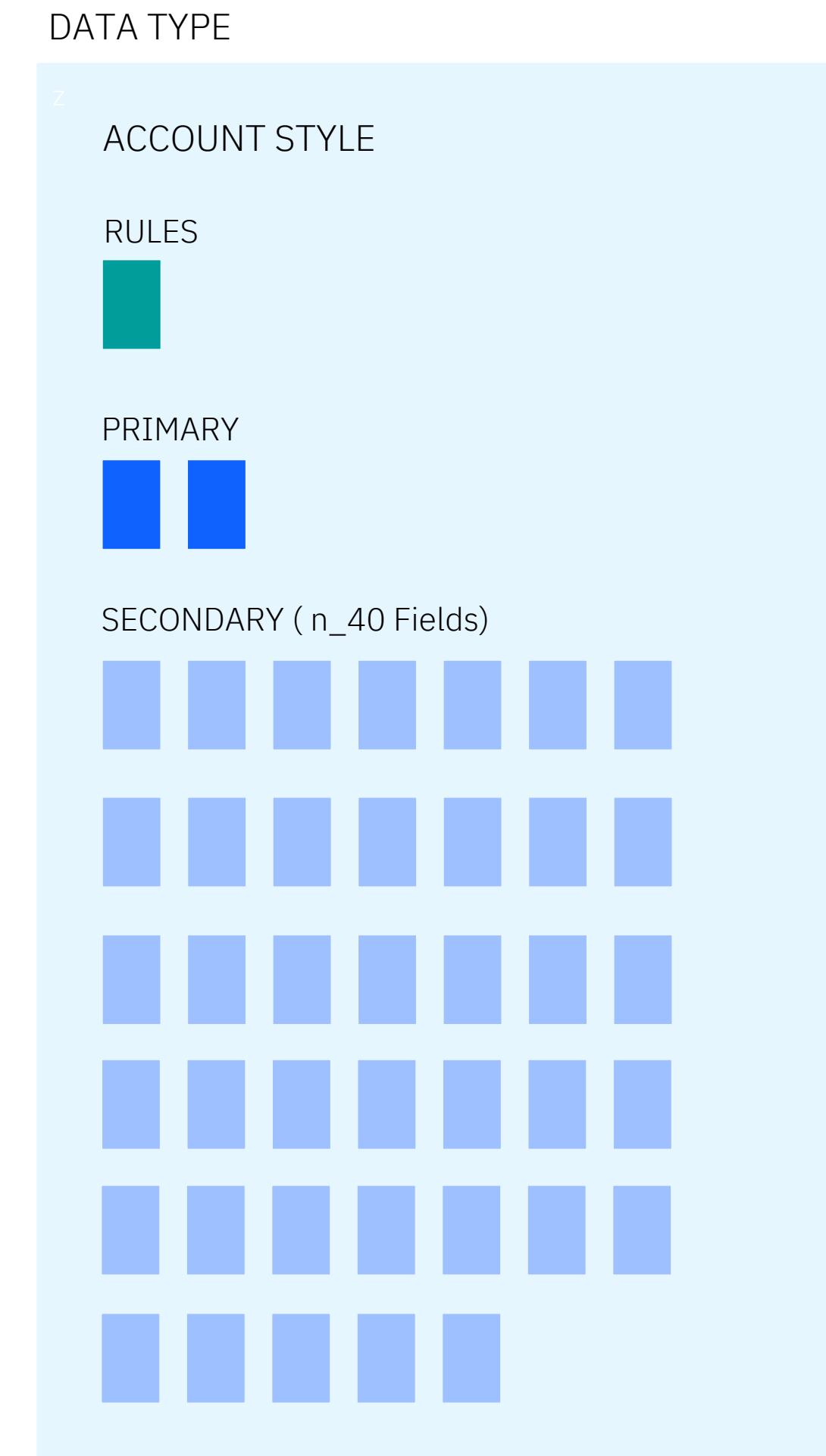
File: Choose File No file chosen

Data Is: Actual

PRIMARY FIELD (CONSUMPTION)

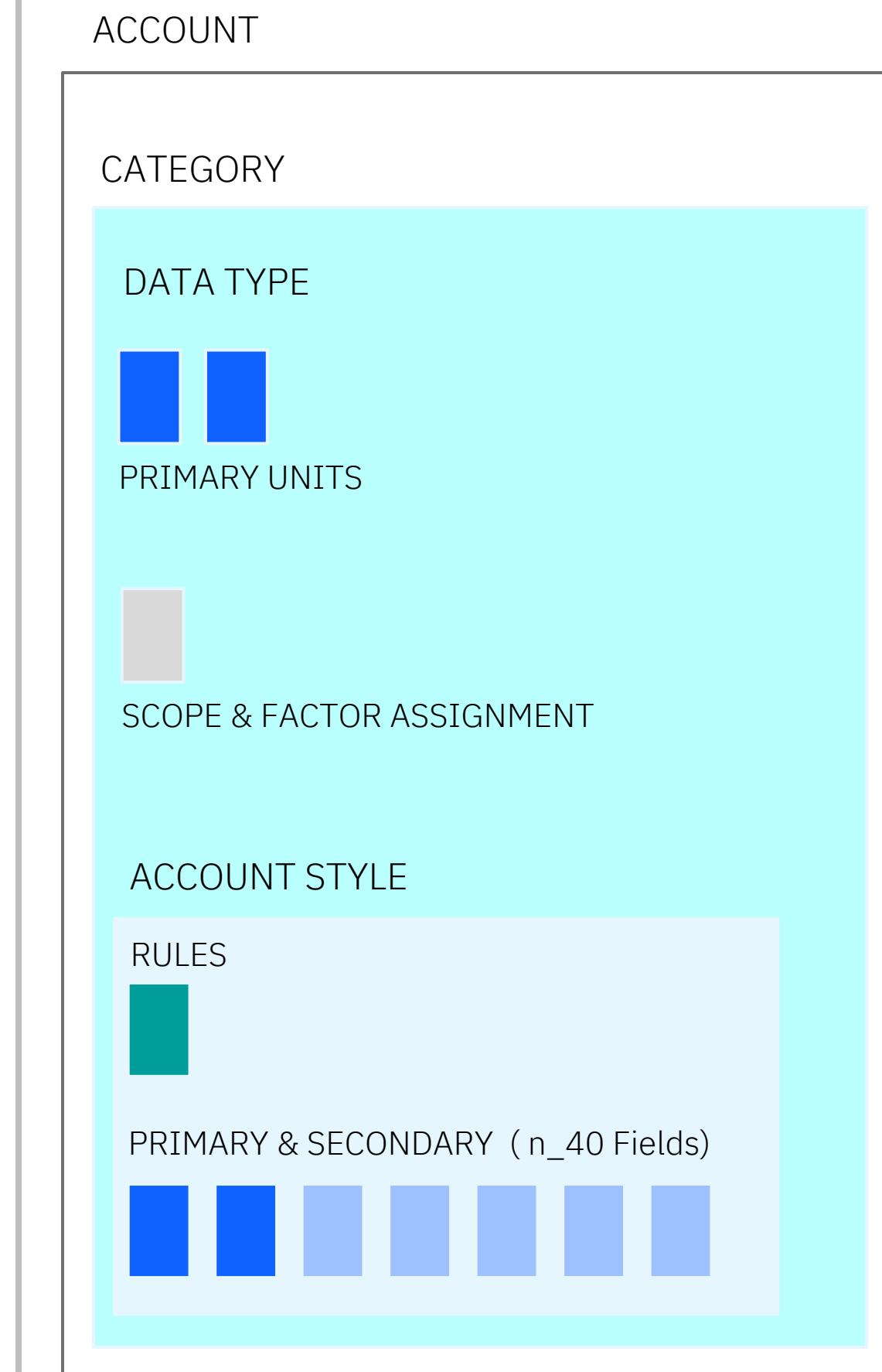
SECONDARY FIELDS

PRIMARY FIELD (COST)



ACCOUNT

- Is unique (name and ID)
- Configured at a location level
- Configured with a specific data type and account style
- Acts as the end point for data storage
- Use as a reporting entity that rolls up through grouping hierarchy



ACCOUNT

ELEC_41011676 ACCOUNT NAME

ELECTRICITY [KWH] DATA TYPE

OPENED ON :-

REPLACED ON :-

Overview

Account Ref:

Linked Meter:

Account Style: **ELECTRICITY SIMPLE ACCOUNT STYLE**

Supplier: **ORIGIN**

Capture Data

Account: ELEC_41011675 - Origin

* Start Period: 3/1/2023

* End Period: 3/31/2023

Reference:

Total KWh: **PRIMARY FIELD (CONSUMPTION)**

Maximum Demand KVA: **SECONDARY FIELDS**

KWh Cost: **PRIMARY FIELD (COST)**

KVA Demand Cost: **SECONDARY FIELDS**

Cost Other: **SECONDARY FIELDS**

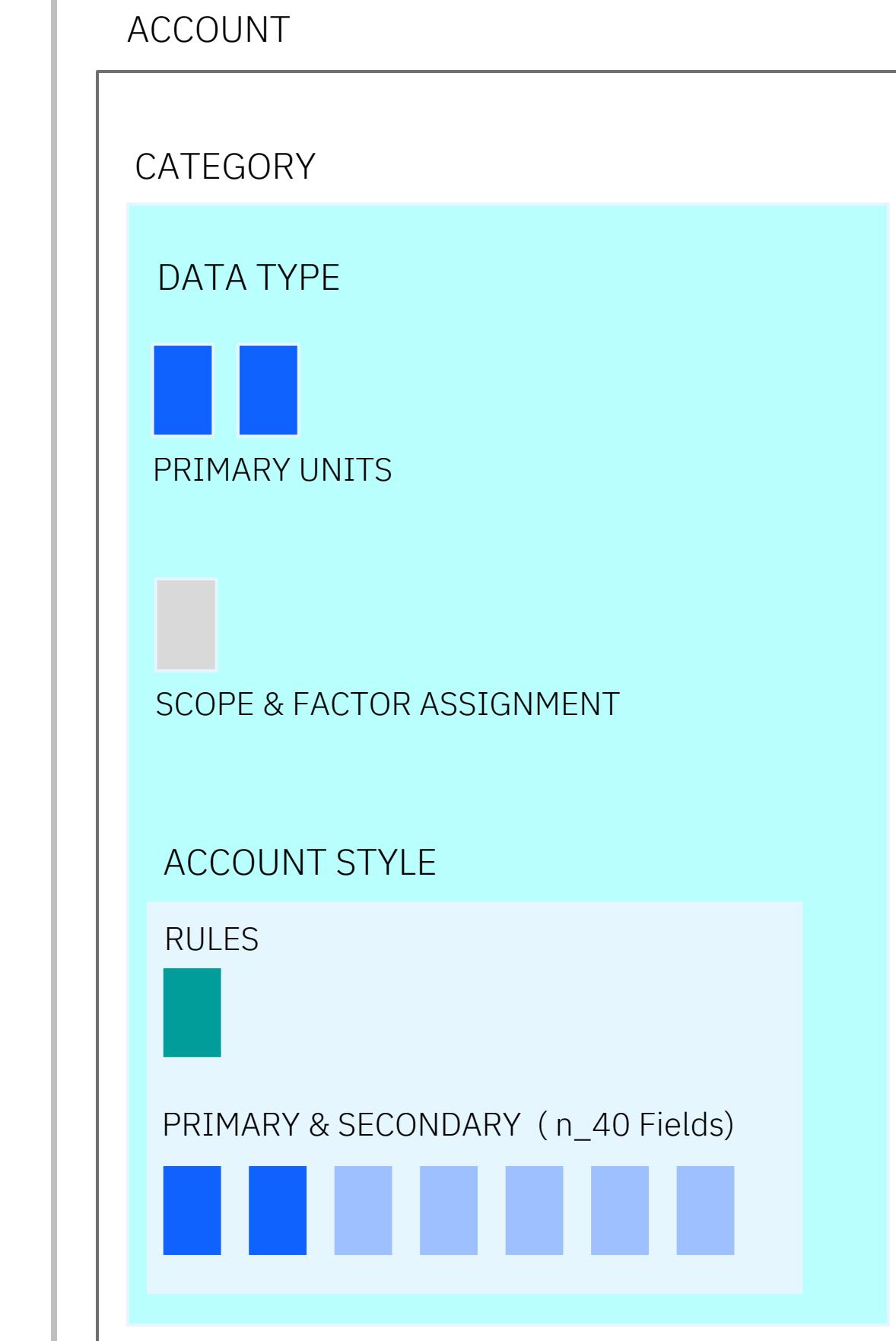
Tax: **SECONDARY FIELDS**

Total Cost: **SECONDARY FIELDS**

File: Choose File No file chosen

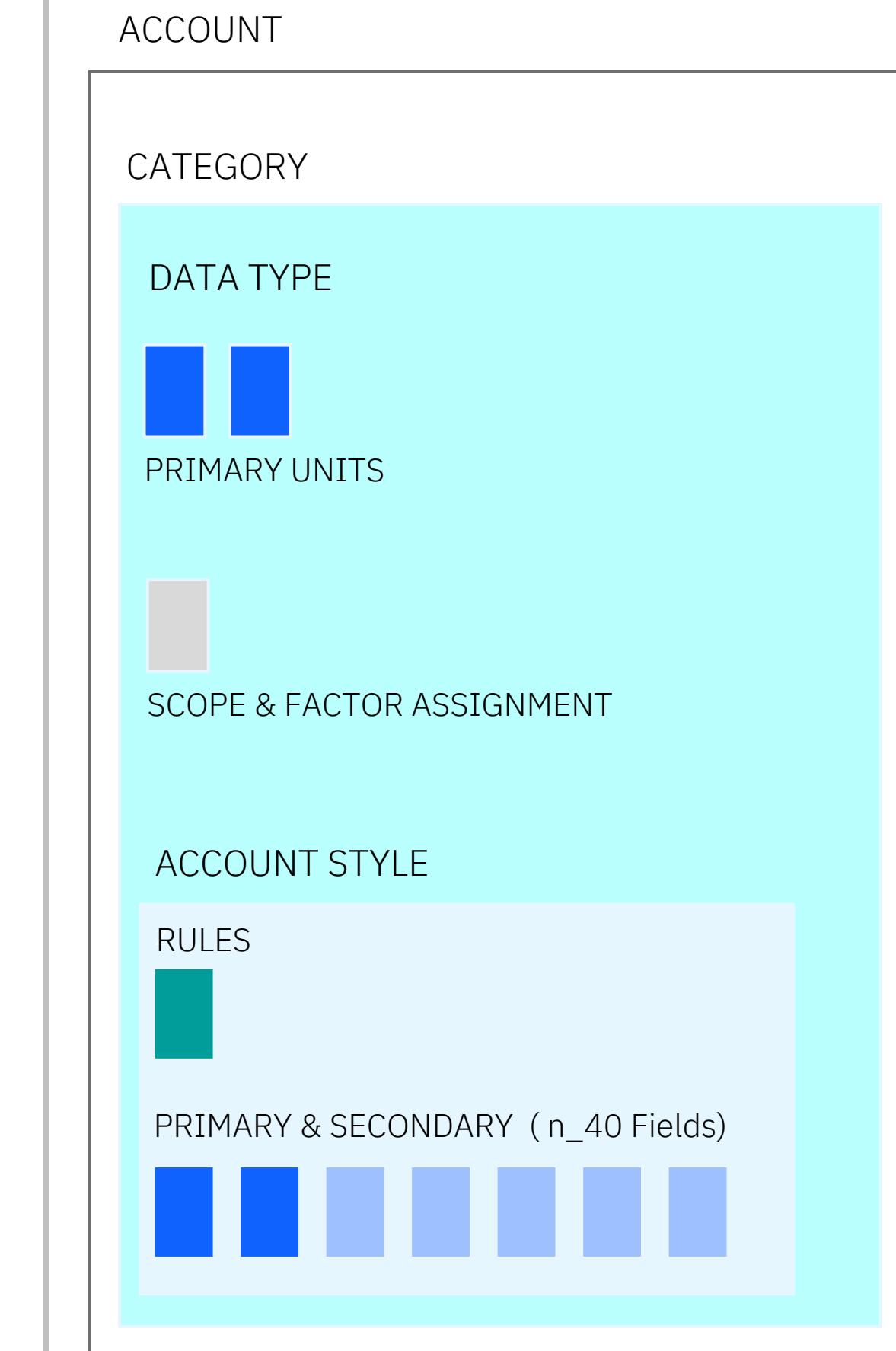
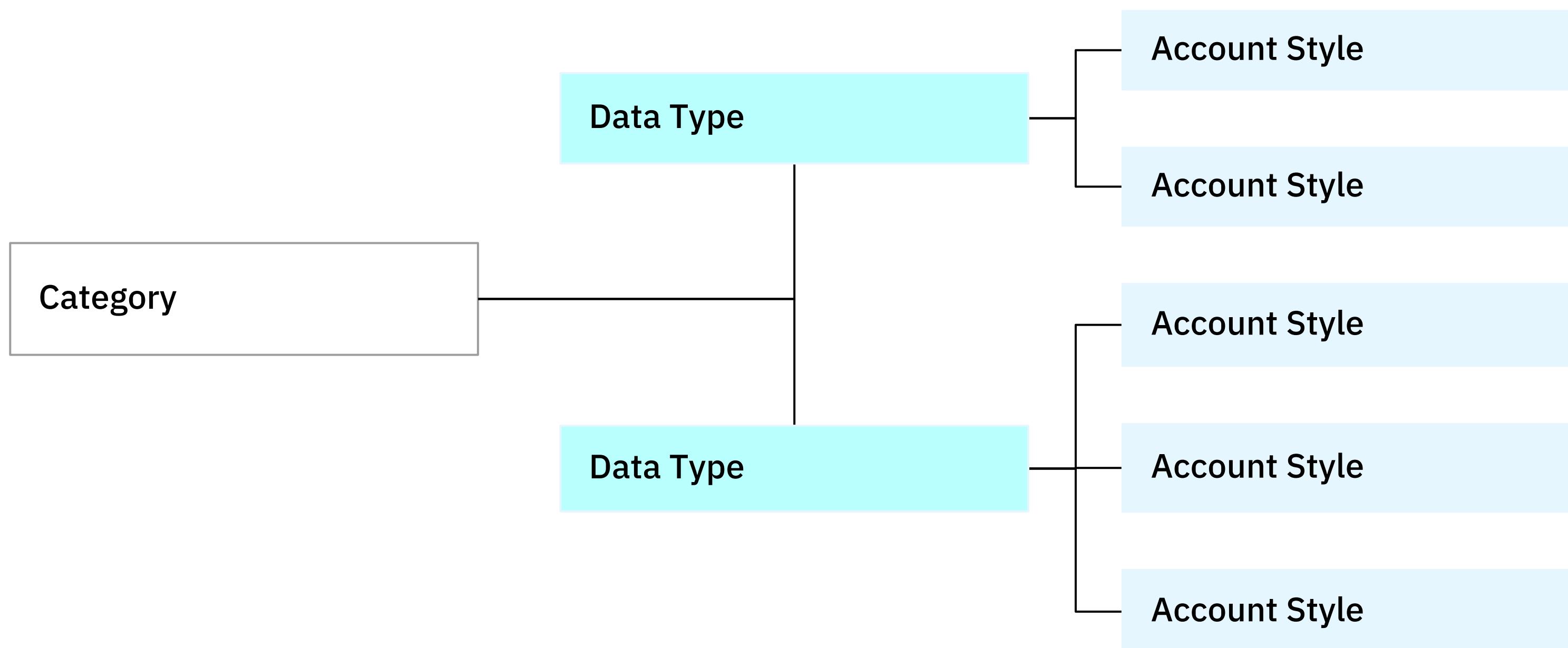
Data Is: Actual

CANCEL **SAVE**



Data Model Summary

- Flexible
- Hierarchical
- Configured to meet client requirements



Content Setup Tools for Configuration & Data Loading

Content Setup tools

- Configurations – Config Connector
- Data loading – Universal Account Connectors

Config Connector:

- Set up Organization Hierarchy
- Update location properties
- Use templates to create

Universal Account Connectors:

- Capture data of different types for various locations
- Uses multiple templates
 - POC Account Setup and Data Load
 - Account Setup Data load

Emission Factors

MONTHLY NORMALIZATION

- Transaction and periodic data is captured over a period or at a point in time.
- Monthly normalization is required to apply factors.

Record_id	Start Date (yyyy/mm/dd)	End Date (yyyy/mm/dd)	Account Number	Amount	Cost
1	2022/01/01	2022/03/05	NG_2387493	11,127.00	\$ 45,620.70
2	2022/03/06	2022/04/13	NG_2387493	25,590.00	\$ 104,919.00
3	2022/04/14	2022/05/15	NG_2387493	11,434.00	\$ 46,879.40
				48,151.00	197,419.10

1	Record_id	Start Date (yyyy/mm/dd)	End Date (yyyy/mm/dd)	Account Number	Amount	Cost	Days
2	1	2021/12/01	2022/02/05	NG_2387493	11,127.00	\$ 45,620.70	67
3	2	2022/02/06	2022/03/13	NG_2387493	25,590.00	\$ 104,919.00	35
4	3	2022/03/14	2022/04/15	NG_2387493	11,434.00	\$ 46,879.40	32
5					48,151.00	197,419.10	134
6	Record	Month	Days	Amount	Cost		
7	10	1	Dec-21	31	5,148.31	\$ 21,108.09	
8	11	1	Jan-22	31	5,148.31	\$ 21,108.09	
9	12	1	Feb-22	5	830.37	\$ 3,404.53	
10	13			67	11,127.00	45,620.70	
11	14						
12	15	2	Feb-22	22	16,085.14	\$ 66,949.09	
13	16	2	Mar-22	13	9,504.86	\$ 38,969.91	
14	17			35	25,590.00	104,919.00	
15	18						
16	19	3	Mar-22	17	\$ 6,074.31	\$ 24,904.68	
17	20	3	Apr-22	15	5,359.69	\$ 21,974.72	
18	21			32	\$ 11,434.00	46,879.40	
19	22						
20	25		Days	Amount	Cost		
21	26		Jan-22	31	5,148.31	\$ 21,108.09	
22	27		Feb-22	28	5,148.31	\$ 21,108.09	
23	28		Mar-22	31	16,915.12	\$ 69,353.02	
24	29		Apr-22	30	15,579.17	\$ 63,874.00	
25	30		May-22	31	5,359.69	\$ 21,974.72	
26	31				48,151.00	\$ 197,419.10	
27							
28							
29							
30							
31							
32							
33							

FACTOR SETS

- Publicly available factor sets:
 - [US EPA](#) (Environmental Protection Agency) – Scope 1
 - [US eGrid](#) – Scope 2 Location-based
 - [UK DEFRA](#) (Department for Environment Food and Rural Affairs) – Scope 1 and 2
 - [US Green-e](#) Residual Mix – Scope 2 Market-based
 - [EU AIB](#) (Association of Issuing Bodies) Residual Mix – Scope 2 Market-based
 - Other national factor sets include: Australia, New Zealand, Canada
- Licenced factor sets:
 - [IEA](#) (International Energy Agency) – Scope 2 Location-based
 - [EORA](#) MRIO (Multi-region input-output) Spend-based Scope 3 factors - [link](#)

Factor fields

- **Region** – city, state, country, global
- **Data type** – eg, Electricity, Natural Gas,
- **Factor Set** – collection of factors
- **Sub type** – sub categorization to link factors to accounts
- **Name** – usually contains year, emission source, unit
- **Conversions**
 - CO₂e/unit
 - CO₂, CH₄, N₂O, BioCO₂e / unit
 - Energy, Volume, Area, Distance / unit
- **Effective and Published Dates** – organizations can apply factors by effective or published dates, depending on preference
- **Factor Source** – Description or attribution of where the factor was sourced
- **Description** – optional, used to provide additional details
- **Notes** – optional, used to record any further calculations applied to determine the resulting factor

Create New...

Parent Region: Earth

Region: Search by Regions

Data Type: Abrasive products [USD]

Factor Set: Custom - Demo Corporation US

Sub Type: Default Factor

Name:

Description:

Total CO₂e (kgCO₂e/unit):

CO₂ (kgCO₂e/unit):

CH₄ (kgCO₂e/unit):

N₂O (kgCO₂e/unit):

BioCO₂ (kgCO₂e/unit):

Indirect CO₂e (kgCO₂e/unit):

Energy (GJ)/unit:

Area (m²)/unit:

Distance (m)/unit:

Uncertainty Factor:

Category 1:

Category 2:

Category 3:

Category 4:

Category 5:

EPA SourceSiteRatio:

Effective From: clear

Effective To: clear

Review On:

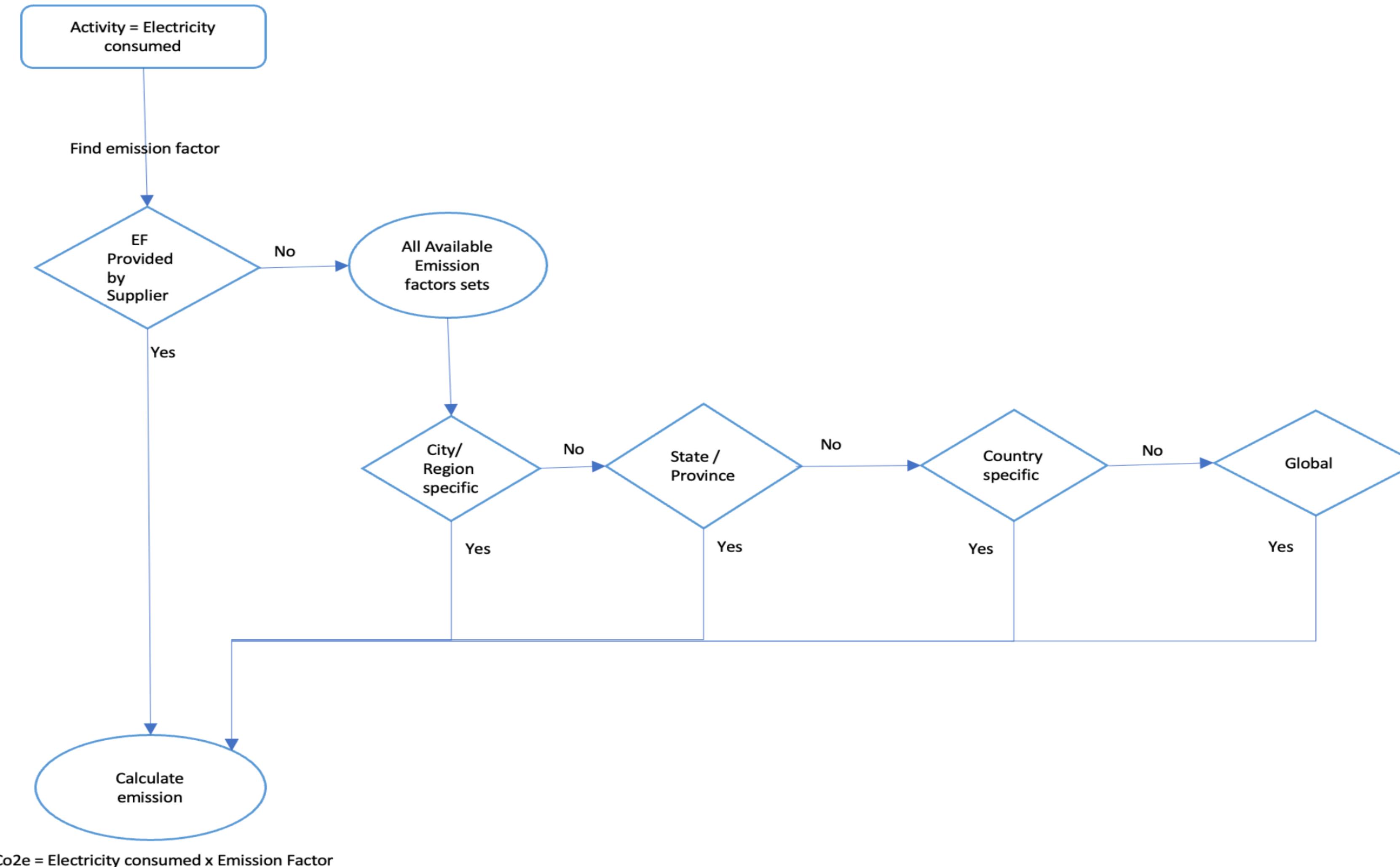
Factor Source:

Notes:

CANCEL SAVE

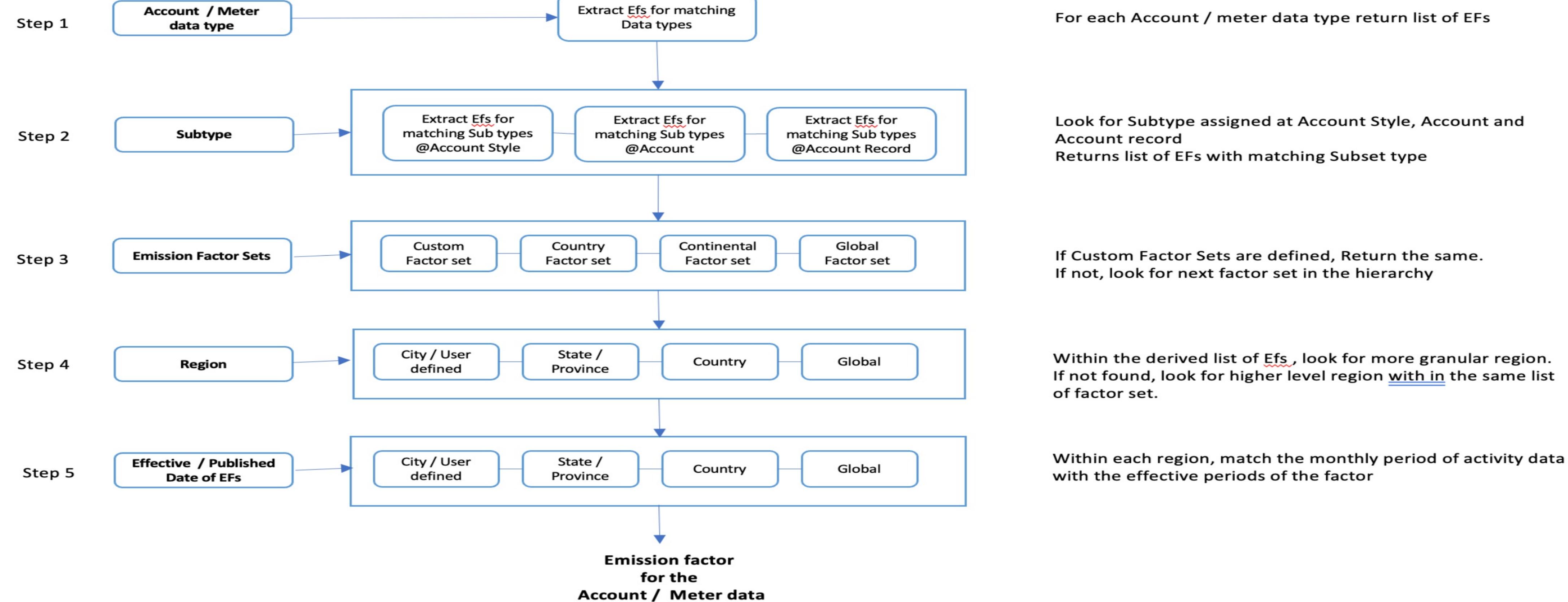
Factor Selection Algorithm

Factor selection



Factor selection

Factor Selection Algorithm Steps



Envizi's factor selection algorithm (FSA) is a process of cycling through a filtered list of factors to arrive at a match on data type, factor set, region and time period.

Step 1 – Each account or meter has a defined data type. The FSA returns a list of all factors that match the account or meter data type.

Step 2 – The FSA then looks at the account style, account and account record for a sub type setting. If there is a sub type assigned, then the FSA restricts searching for factors that have the same sub type.

Step 3 – Users can define their preferred configuration of emission factor sets. When a factor isn't found within a factor set, the FSA looks in the next factor set.

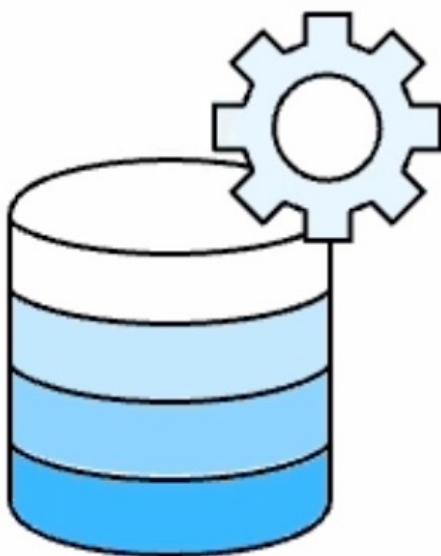
Step 4 – Within a factor set the FSA compares a location's region to the most granular region first. If a factor isn't found, then the FSA looks within a higher regional level as factors can be assigned.

Step 5 – Within each region the FSA looks to match the monthly period of the activity data with the effective periods of the factor. When a factor isn't found the FSA searches at a higher region or the next factor set in the hierarchy.

1 - Data Type

Envizi Manages

>3,000 data types >40,000 emission factors



For example:

Electricity [kWh]

Natural Gas [GJ]

Natural Gas [m3]

Paper [kg]

CO2e [tonnes CO2e]

R-143a [kg]

Commuting [pkm]

Office furniture [\$USD]

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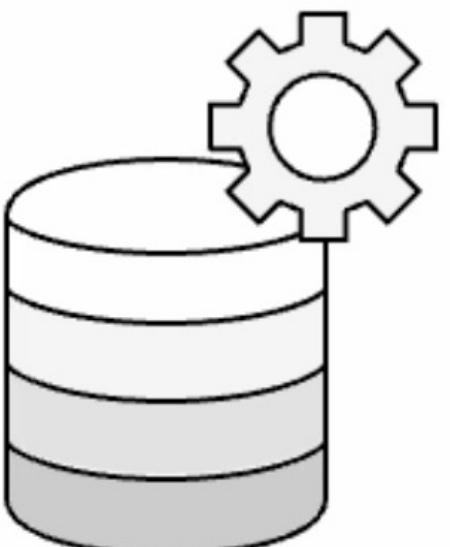
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For example:

Electricity [kWh]

Natural Gas [GJ]

Natural Gas [m3]

Paper [kg]

CO2e [tonnes CO2e]

R-143a [kg]

Commuting [pkm]

Office furniture [\$USD]

2 – Sub Type

Optional

Account
Style

Is there a sub type configured at the Account Style level? If yes, restrict FSA to that sub type. If 'selectable', look at account. If 'no', look for factors without sub type.

Account

Is the account configured with a sub type? If yes, restrict FSA to that sub type. If 'selectable', look at account record. If 'no', look for factors without sub type.

Account
Record

Is the account record captured with a sub type? If yes, restrict FSA to that sub type. If not, look for factors without sub type.

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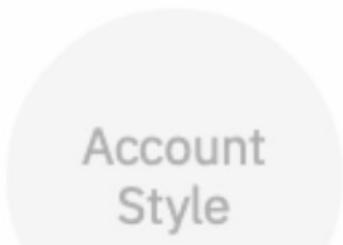
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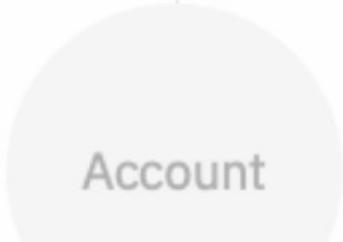
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2 – Sub Type

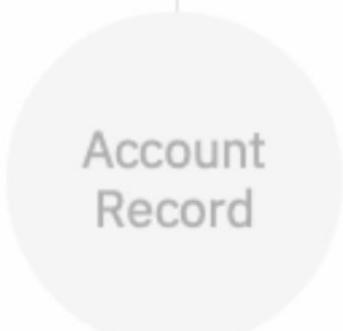
Optional



Is there a sub type configured at the Account Style level? If yes, restrict FSA to that sub type. If 'selectable', look at account. If 'no', look for factors without sub type.

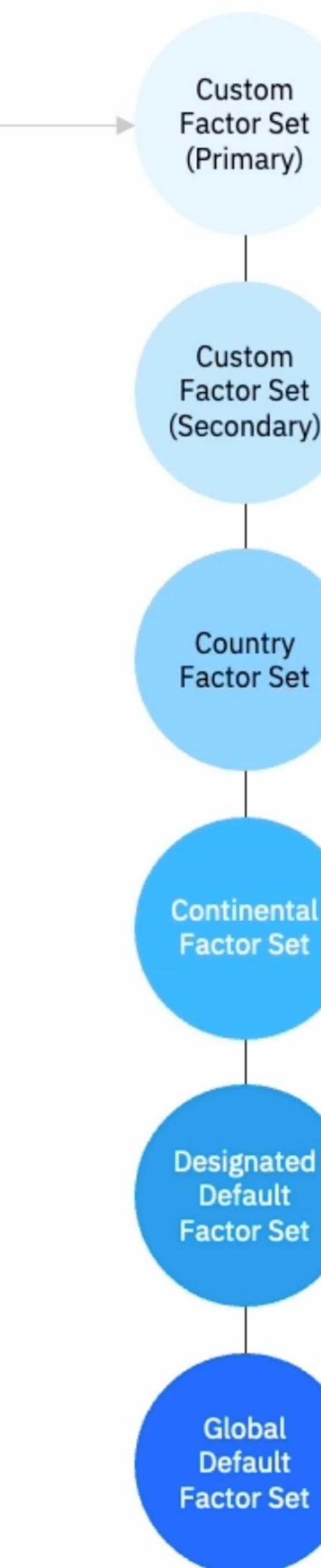


Is the account configured with a sub type? If yes, restrict FSA to that sub type. If 'selectable', look at account record. If 'no', look for factors without sub type.



Is the account record captured with a sub type? If yes, restrict FSA to that sub type. If not, look for factors without sub type.

3 - Factor Set



Optional. Enabled to allow users to capture custom emission factors

Optional. Provides option to secondary custom factor set or users can request managed factor sets to be applied after the primary custom factor set.

Some countries (e.g. UK, USA, Australia, etc.) have published factor sets. These factors are applied with custom factors are not available.

Europe = DEFRA,
North America = eGrid and
US Climate Leaders,
Oceania = NGER

Optional. Users can request for managed factor sets to be applied in regions not covered by country or continental factors.

If no factors around found in the factor set hierarchy then factors from IEA, IPCC and the GHG Protocol calculation tools are applied.

Envizi's factor selection algorithm (FSA) is process of cycling through a filtered list of factors to arrive at a match on data type, factor set, region and time period.

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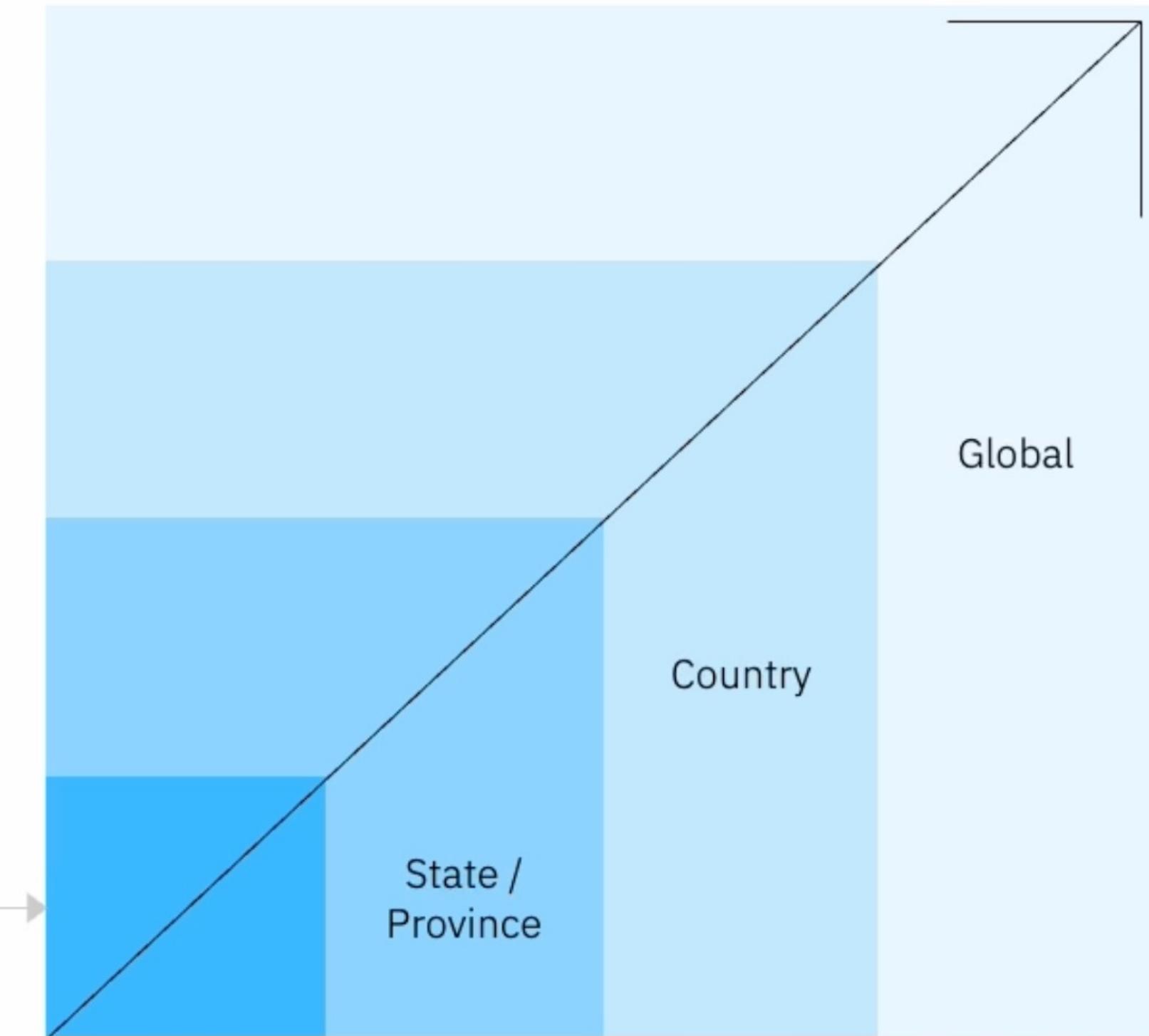
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4 - Region



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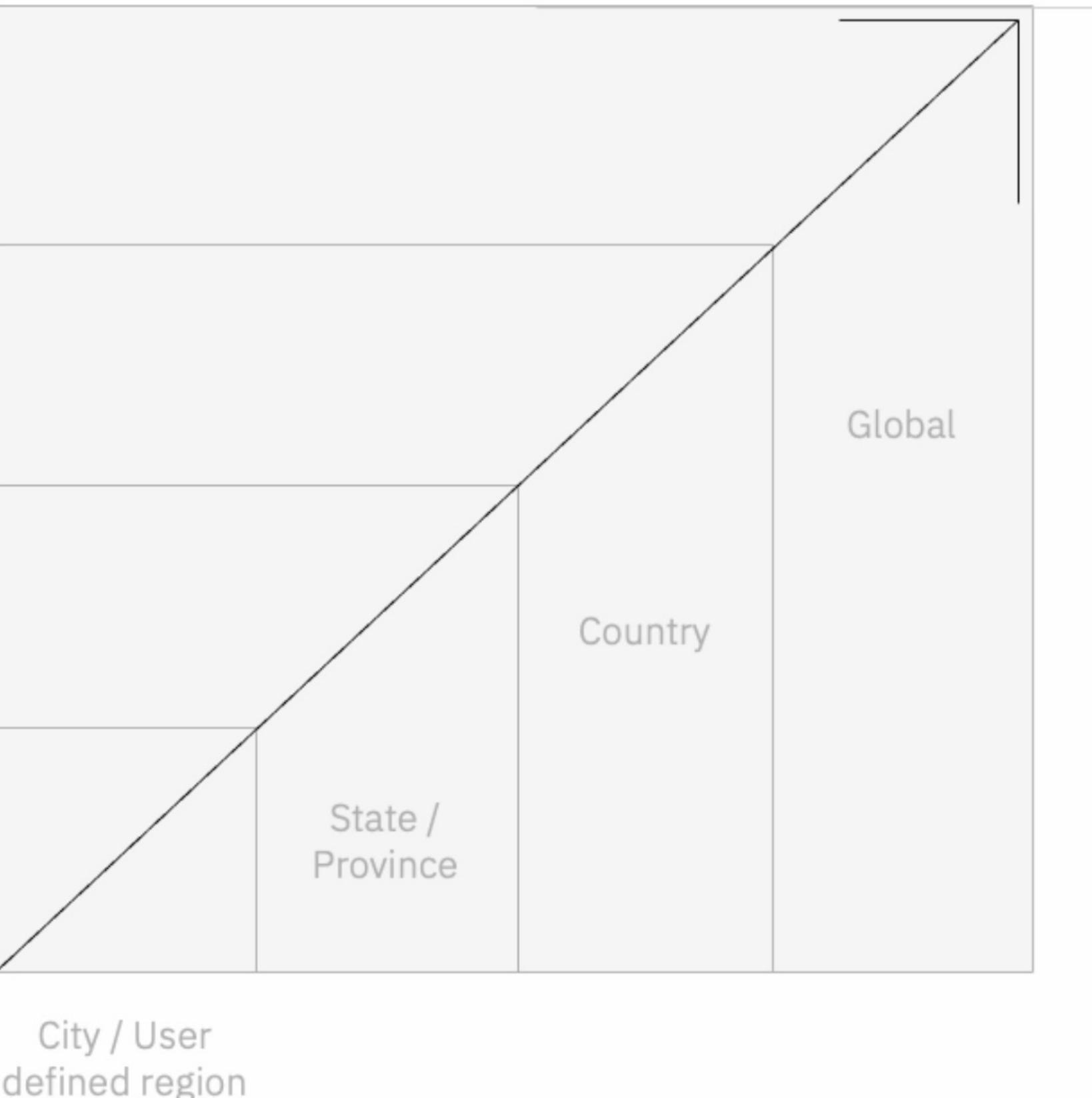
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4 - Region



5 - Effective periods

Date	Activity Data	Factor Effective Period	Factor Published Period
Jan-18			
Feb-18			
Mar-18			
Apr-18			
May-18			
Jun-18			Factor 2
Jul-18			
Aug-18			
Sep-18			
Oct-18			
Nov-18			
Dec-18			
Jan-19			
Feb-19			
Mar-19			
Apr-19			
May-19			
Jun-19			
Jul-19			
Aug-19			
Sep-19			
Oct-19			
Nov-19			
Dec-19			
Jan-20			
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Mar-20			
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Jun-20			
Jul-20			
Aug-20			
Sep-20			
Oct-20			
Nov-20			
Dec-20			
Jan-21			
Feb-21			
Mar-21			
Apr-21			
May-21			
Jun-21			

Backup

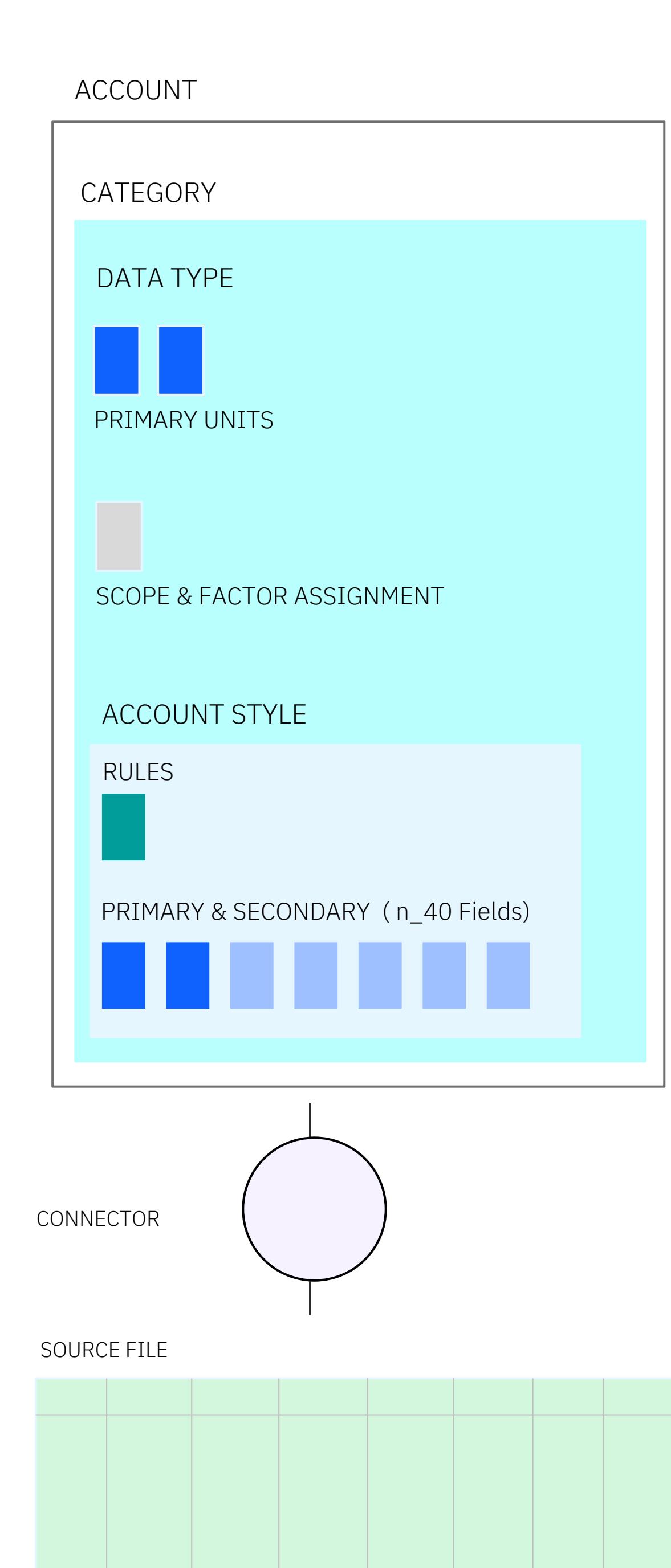
Before we talk
about data
integrations, let's
talk about the
customer

The customer is focused
on how a tool can solve
their problem, not what
tool is used

Data integrations are no different, the tools used need to help solve a customer's problem at an accepted price point

CONNECTORS

- Custom per source system, per customer
- Extracts, Transforms and Loads source files to:
 - Data fields as defined by the [account style](#) and,
 - End points as defined by the [account name](#) or [ID](#).



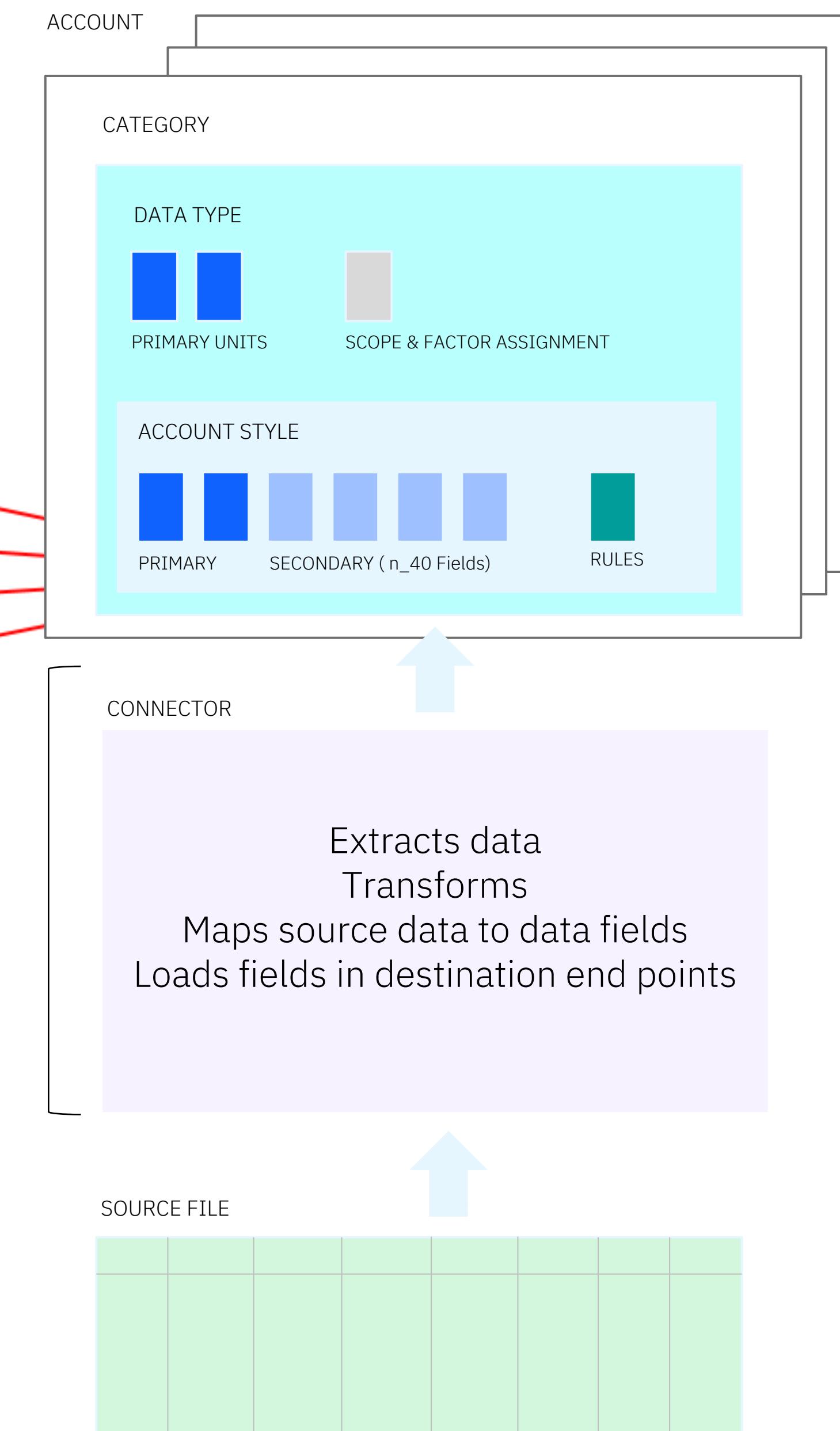
CURRENT PROCESS

1. A 'connector' is programmed to match on an incoming data file based on:
 - File Name and Format
 - Tab Name
 - Column headings

NMI	Account No.	Invoice No.	Bill Start	Bill End	Total kwh
3033275602	3033275-E1	5977655	01-JUL-2014	31-JUL-2014	0
3033275611	3033275-E1	5980515	01-JUL-2014	31-JUL-2014	0
3033275653	3033275-AA	5971137	01-JUL-2014	31-JUL-2014	2,198
4103147550	4103147-DOM	5988444	01-JUL-2014	31-JUL-2014	0

2. The connector looks through each data row, and picks up on programmed data patterns. Anything that does not match the 'load' program is skipped. E.g. Load data rows where column 6 contains a number > 0

3. For data rows that match the 'load' program, specific data fields are loaded into Envizi. E.g. Load columns 2 (Account No.), 4 (Bill Start), 5 (Bill End) and 6 (Total kwh)



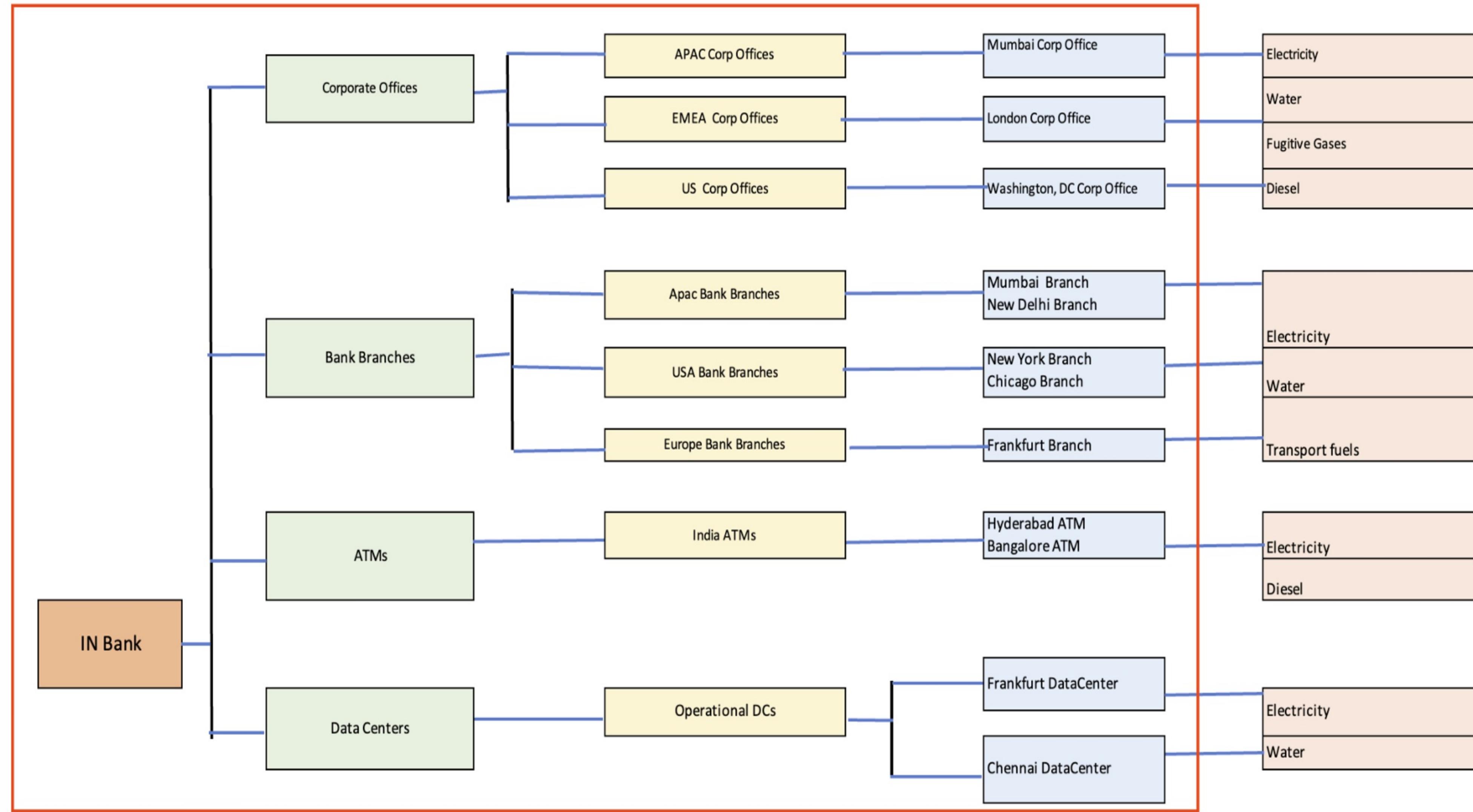
Virtual Accounts

Virtual accounts are accounts whose data is automatically derived from the monthly data of other accounts, meters, and even static attribute values.

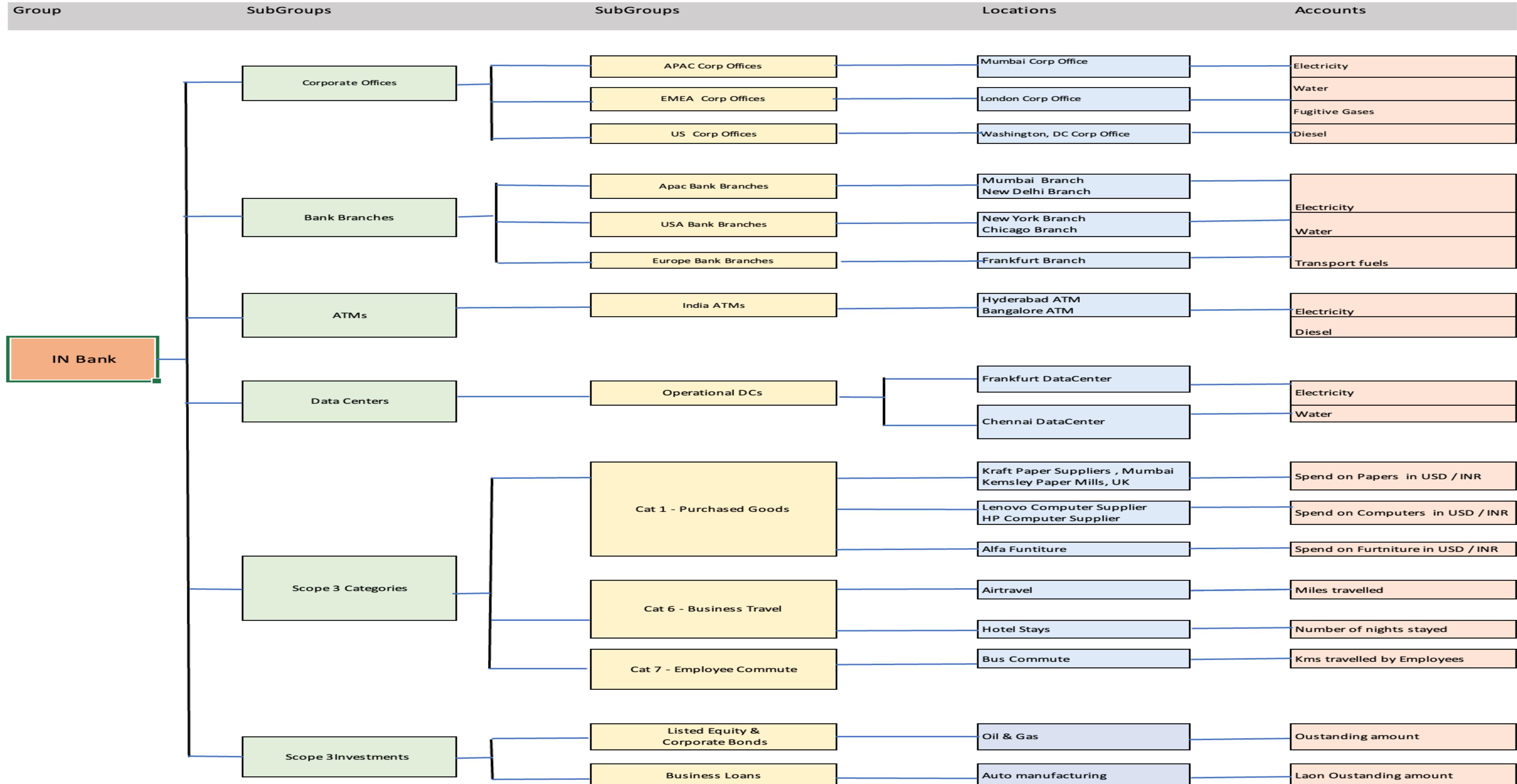
The solution relies on Virtual Data Rules that are applied to virtual accounts where the variables in those rules are populated by nominated source data.

Connectors

A Sample Customer Organization



A Sample Customer Organization



A Sample Customer Organization



Solution Overview & Pathways

