

Tracking Progress of the Mitigation Commitments of Nationally Determined Contributions (NDCs)

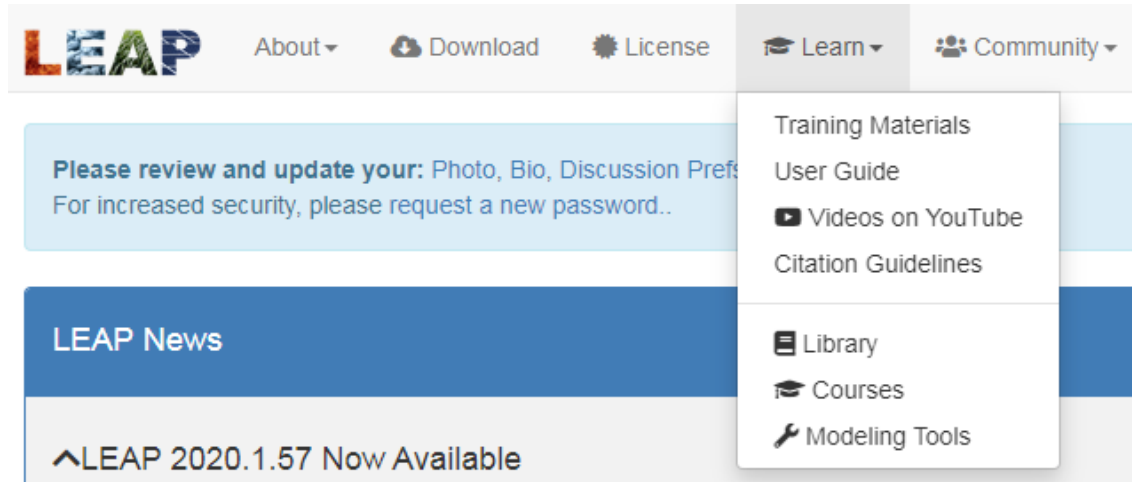
LEAP tool

Dominic Sheldon

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Planning and Transparency

Ricardo Energy and Environment

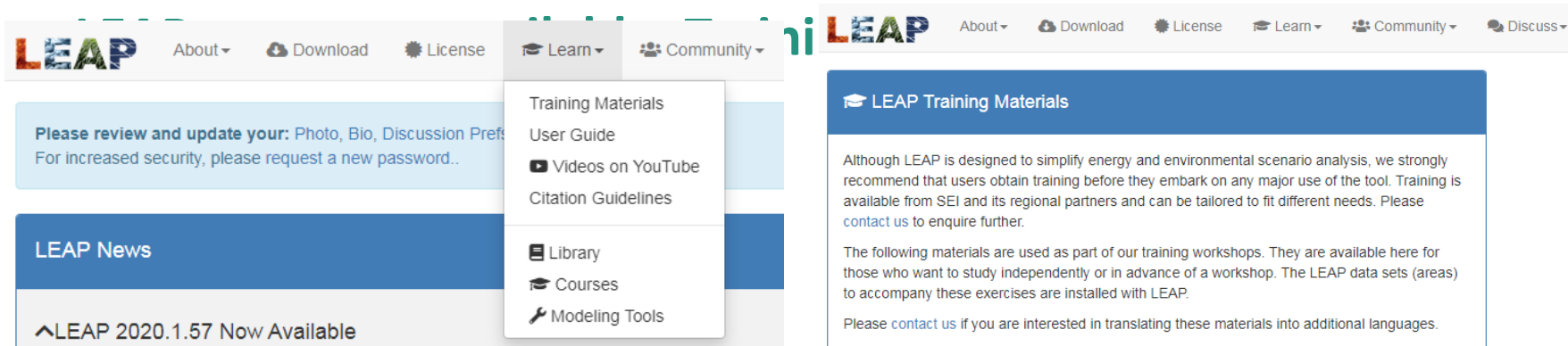
LEAP resources available



The screenshot shows the LEAP website's navigation bar. The 'Learn' dropdown menu is open, displaying the following options:

- Training Materials
- User Guide
- Videos on YouTube
- Citation Guidelines
- Library
- Courses
- Modeling Tools

Other visible elements in the navigation bar include 'About', 'Download', 'License', and 'Community'. A blue notification banner at the top of the page reads: 'Please review and update your: Photo, Bio, Discussion Pref... For increased security, please request a new password..'. Below the navigation bar, there is a 'LEAP News' section and a notification for 'LEAP 2020.1.57 Now Available'.



The screenshot shows the LEAP website interface. At the top, there is a navigation bar with the LEAP logo and links for 'About', 'Download', 'License', 'Learn', 'Community', and 'Discuss'. Below the navigation bar, there is a blue banner with the text 'Please review and update your: Photo, Bio, Discussion Preferences. For increased security, please request a new password..'. Below this, there is a 'LEAP News' section with a sub-section for 'LEAP 2020.1.57 Now Available'. A dropdown menu is open under the 'Learn' link, showing options for 'Training Materials', 'User Guide', 'Videos on YouTube', 'Citation Guidelines', 'Library', 'Courses', and 'Modeling Tools'.

Main Training Exercises

The first four of these exercises teach basic LEAP skills including energy demand modeling, energy supply (Transformation) modeling, electric system simulation modeling, emissions analysis and cost-benefit analysis. The fifth exercise examines modeling of non-energy sector greenhouse gases. The sixth exercise focuses on the transport sector: showing how to create a vehicle stock-turnover model. The seventh exercise demonstrates the use of LEAP's optimization features for least-cost electric generation modeling.

LEAP Training Materials

Although LEAP is designed to simplify energy and environmental scenario analysis, we strongly recommend that users obtain training before they embark on any major use of the tool. Training is available from SEI and its regional partners and can be tailored to fit different needs. Please contact us to enquire further.

The following materials are used as part of our training workshops. They are available here for those who want to study independently or in advance of a workshop. The LEAP data sets (areas) to accompany these exercises are installed with LEAP.

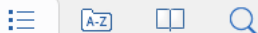
Please contact us if you are interested in translating these materials into additional languages.

GHG Mitigation Analysis Exercises

These exercises introduce techniques used in a Greenhouse Gas (GHG) Mitigation Assessment. In a first exercise, you use a spreadsheet-based tool to conduct a screening of mitigation options, including analyzing the costs and mitigation potential for each option and displaying these on a standard Marginal Abatement Cost (MAC) curve. In a second exercise, you examine additional important criteria using a multi criteria assessment (MCA) approach. In a third exercise you create a mitigation scenario within LEAP based on your preferred options and compare it to a baseline scenario.

- [GHG Training Exercises](#) (English: PDF)
- Excel Screening spreadsheet: [Partial](#), [Complete](#)

LEAP Help



Introduction

- Getting Started
- History of LEAP
- LEAP Structure
- Credits
- Data Requirements

Views

Interface

Scenarios

Key Assumptions

Effects

Demand

Tagging Branches

Transformation

Stock Changes and Statistical Differences

Resources

Land-Based Resources

The Integrated Benefits Calculator (IBC)

Introduction

See also: [Getting Started](#)



The [Low Emissions Analysis Platform \(LEAP\)](#) is a widely-used software tool for energy policy, climate change mitigation and air pollution abatement planning developed at the [Stockholm Environment Institute \(SEI\)](#). LEAP has been adopted by thousands of organizations in more than 190 countries worldwide. Its users include government agencies, academics, non-governmental organizations, consulting companies, and energy utilities, and it has been used at scales ranging from cities and states to national, regional and global applications.

Integrated Planning

LEAP is an integrated modeling tool that can be used to track energy consumption, production and resource extraction in all sectors of an economy. It can be used to account for both energy sector and non-energy sector greenhouse gas (GHG) emission sources and sinks. In addition to tracking GHGs, LEAP can also be used to analyze emissions of local and regional air pollutants, making it well-suited to studies of the climate co-benefits of local air pollution reduction.

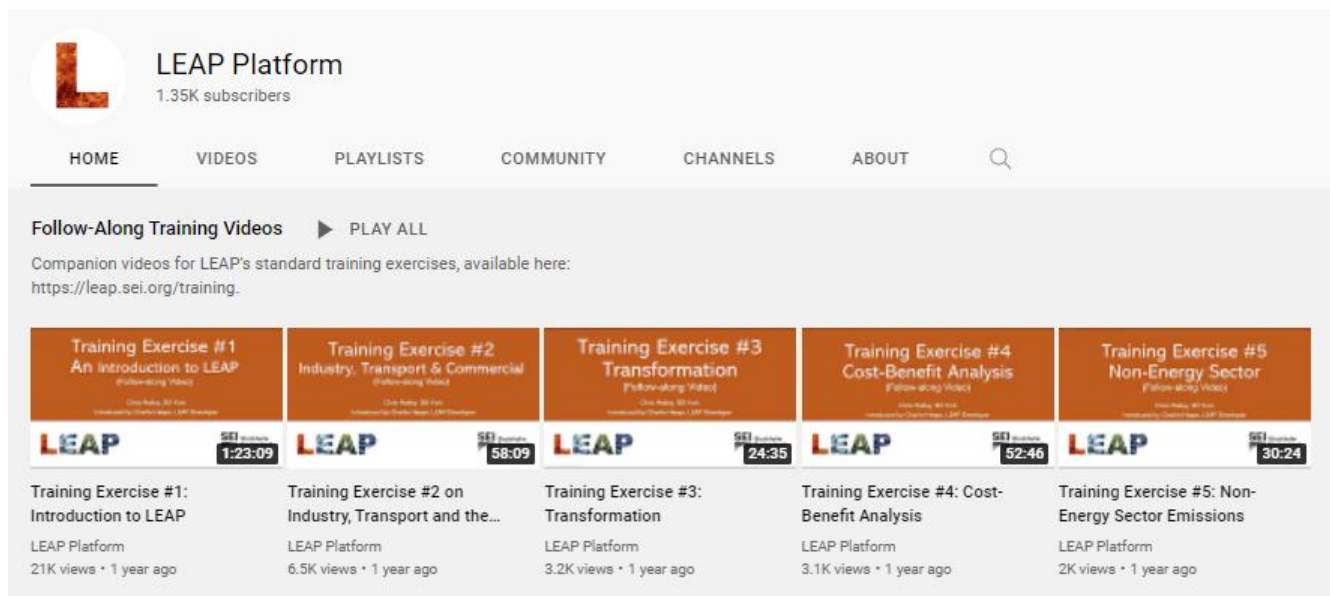
Flexibility And Ease-Of Use





The Low Emissions Analysis Platform

LEAP
 resources
 available:
YouTube
 training
 videos













LEAP Platform
 1.35K subscribers

HOME VIDEOS PLAYLISTS COMMUNITY CHANNELS ABOUT 🔍

Follow-Along Training Videos ▶ PLAY ALL

Companion videos for LEAP's standard training exercises, available here:
<https://leap.sei.org/training>

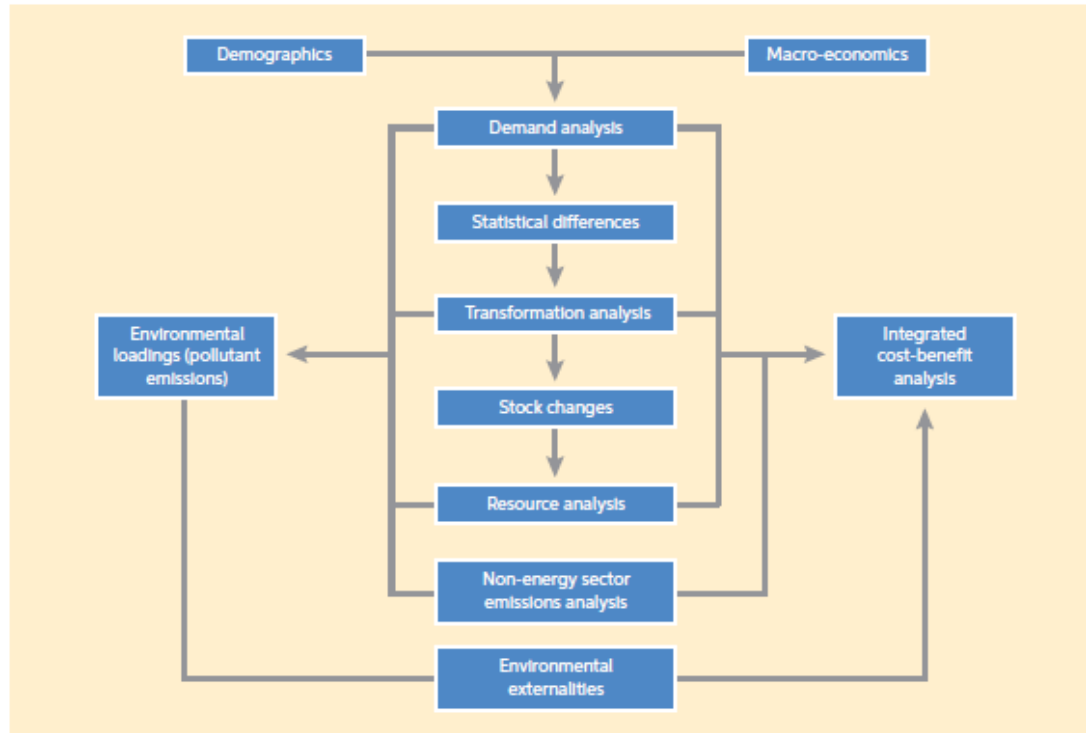
| Training Exercise #1 | Training Exercise #2 | Training Exercise #3 | Training Exercise #4 | Training Exercise #5 |
|---|--|---|---|---|
| An Introduction to LEAP <small>(Following Video)</small> | Industry, Transport & Commercial <small>(Following Video)</small> | Transformation <small>(Following Video)</small> | Cost-Benefit Analysis <small>(Following Video)</small> | Non-Energy Sector <small>(Following Video)</small> |
|   1:23:09 |   58:09 |   24:35 |   52:46 |   30:24 |
| Training Exercise #1: Introduction to LEAP LEAP Platform 21K views • 1 year ago | Training Exercise #2 on Industry, Transport and the... LEAP Platform 6.5K views • 1 year ago | Training Exercise #3: Transformation LEAP Platform 3.2K views • 1 year ago | Training Exercise #4: Cost- Benefit Analysis LEAP Platform 3.1K views • 1 year ago | Training Exercise #5: Non- Energy Sector Emissions LEAP Platform 2K views • 1 year ago |

Introduction to LEAP

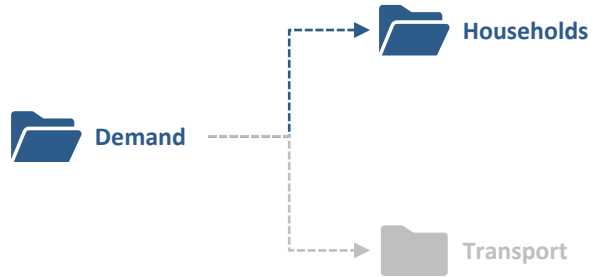
In order to develop the scenarios described in the previous section, a pre-existing model, the Low Emissions Analysis Platform (LEAP), was used. LEAP is an integrated, scenario-based modelling tool that can be used to track energy consumption, production and resource extraction in all sectors of an economy. The benefits of using LEAP in this project are:

- It is a model that is **familiar to key stakeholders around the world** and has been used for previous modelling exercises, so will allow for greater comparability with previous GHG scenarios.
- The **LEAP model has been used for NDCs and LTSs**
- The model **is relatively simple to use**.
- The **model is free for developing countries to use**
- Its **low initial data requirements** are well suited to a country like Uganda where accessing robust data has been, and will continue to be, a challenge.
- It presents outputs in a **transparent and intuitive** way.

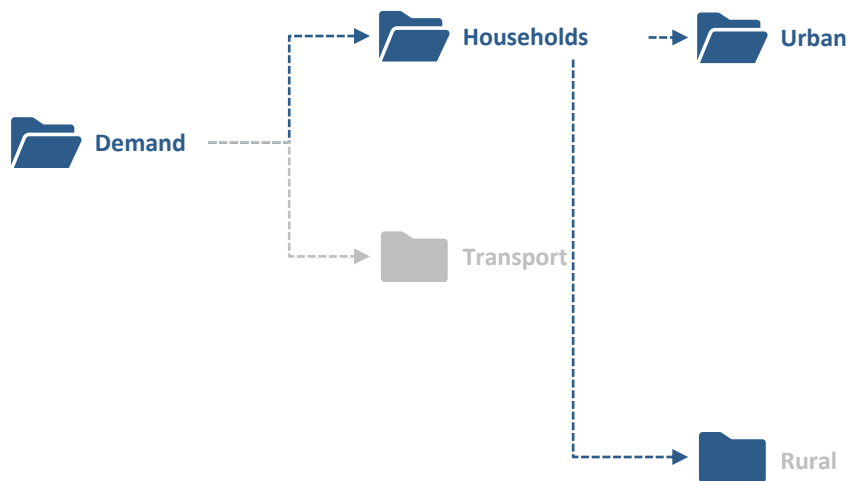
LEAP can be intimidating



Basic structure of LEAP model: The Tree and its branches

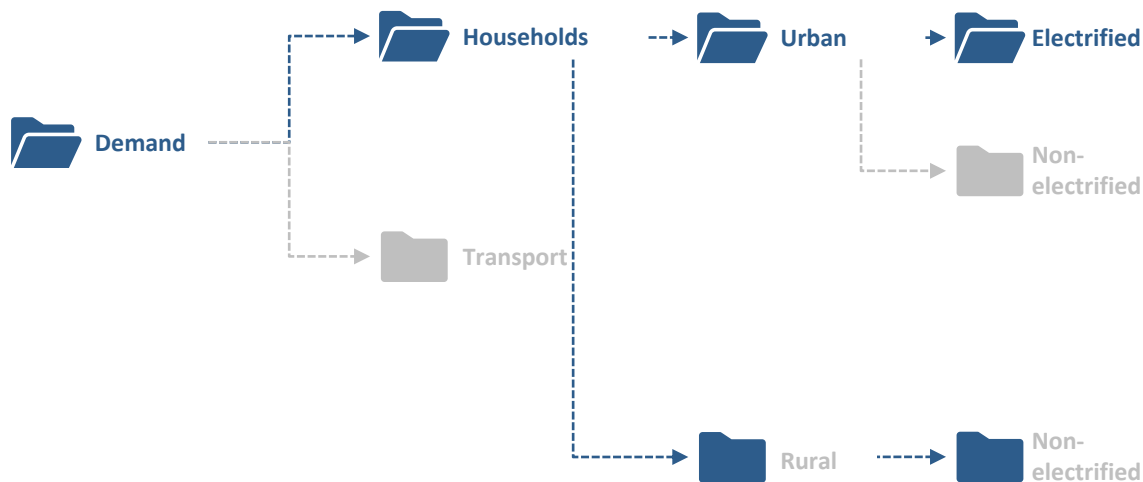


Basic structure of LEAP model: The Tree and its branches



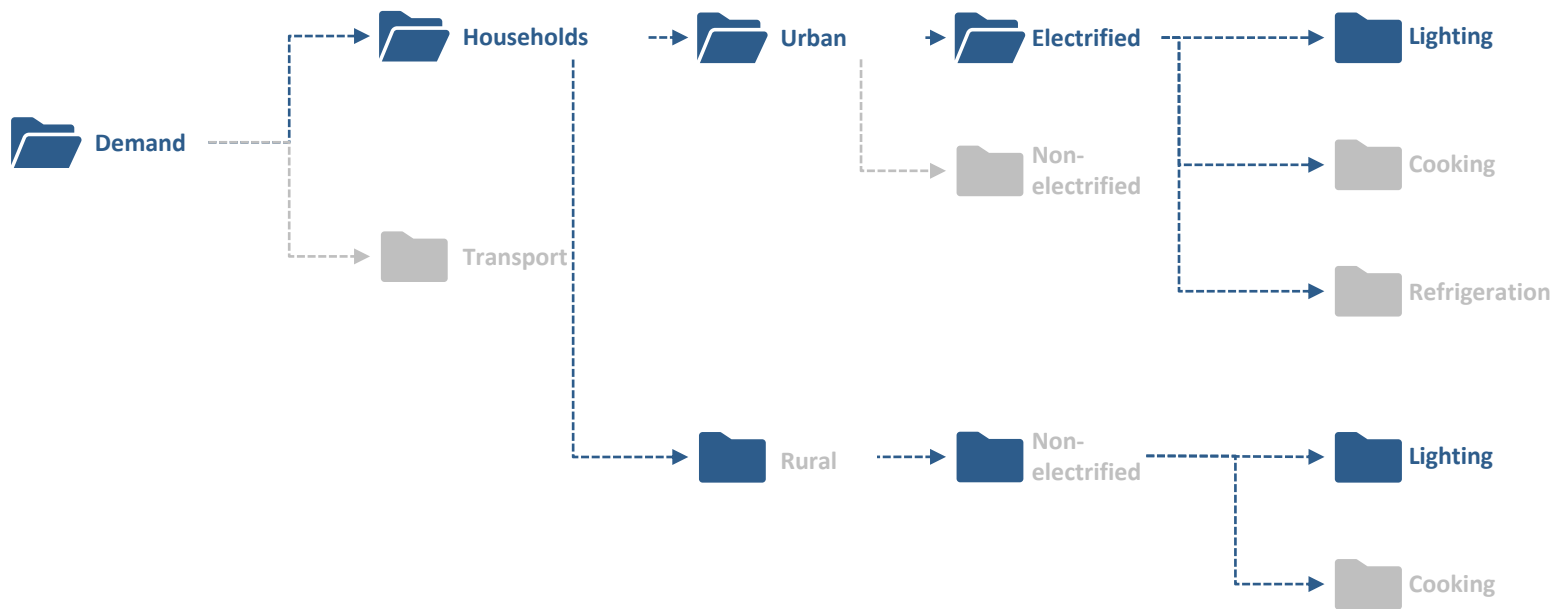


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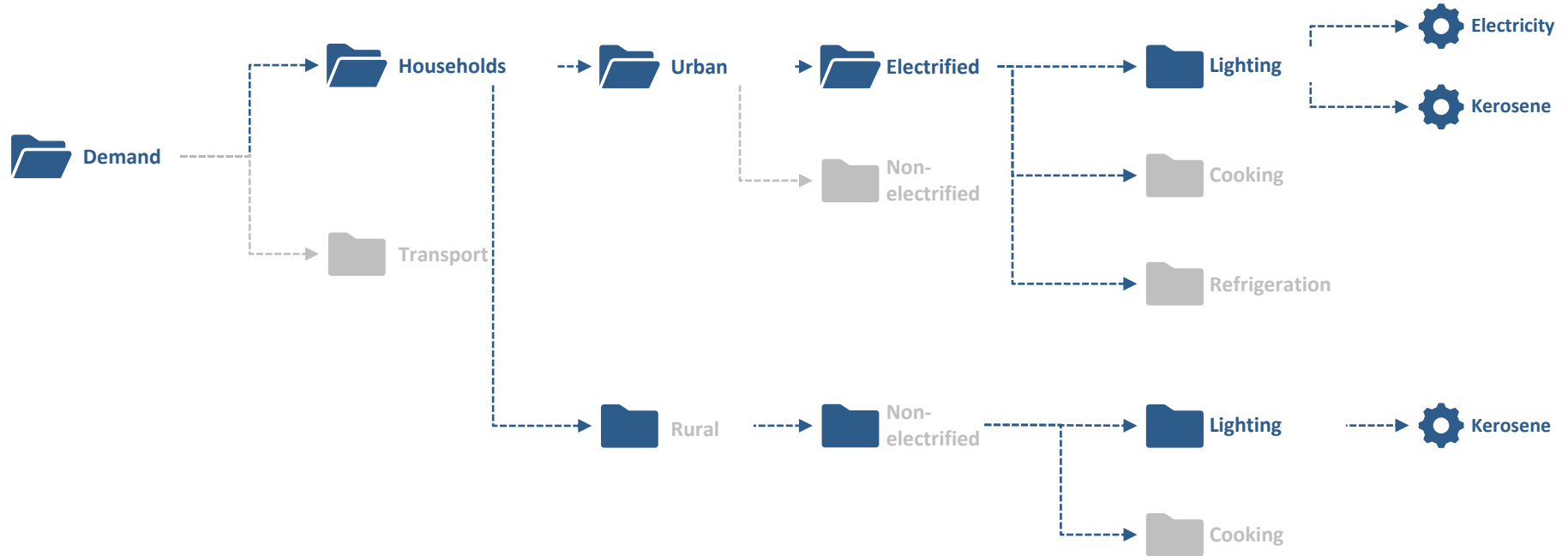




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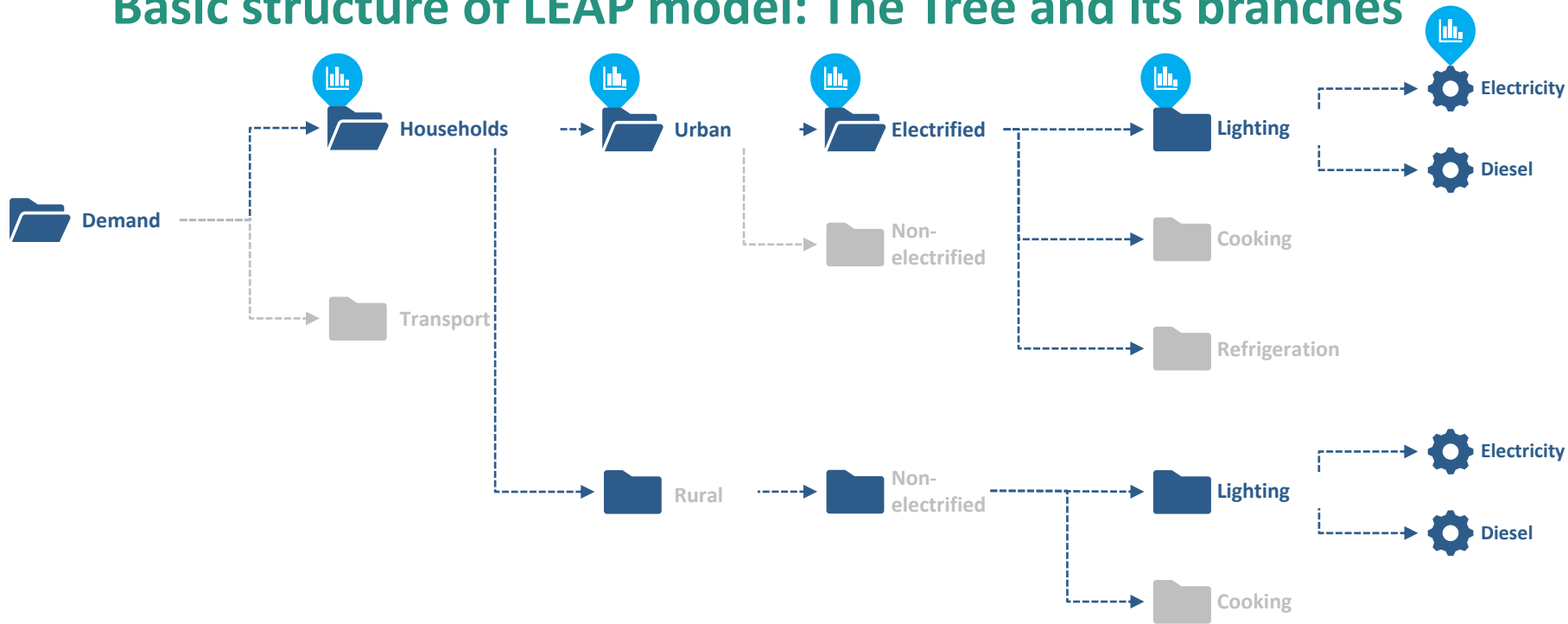


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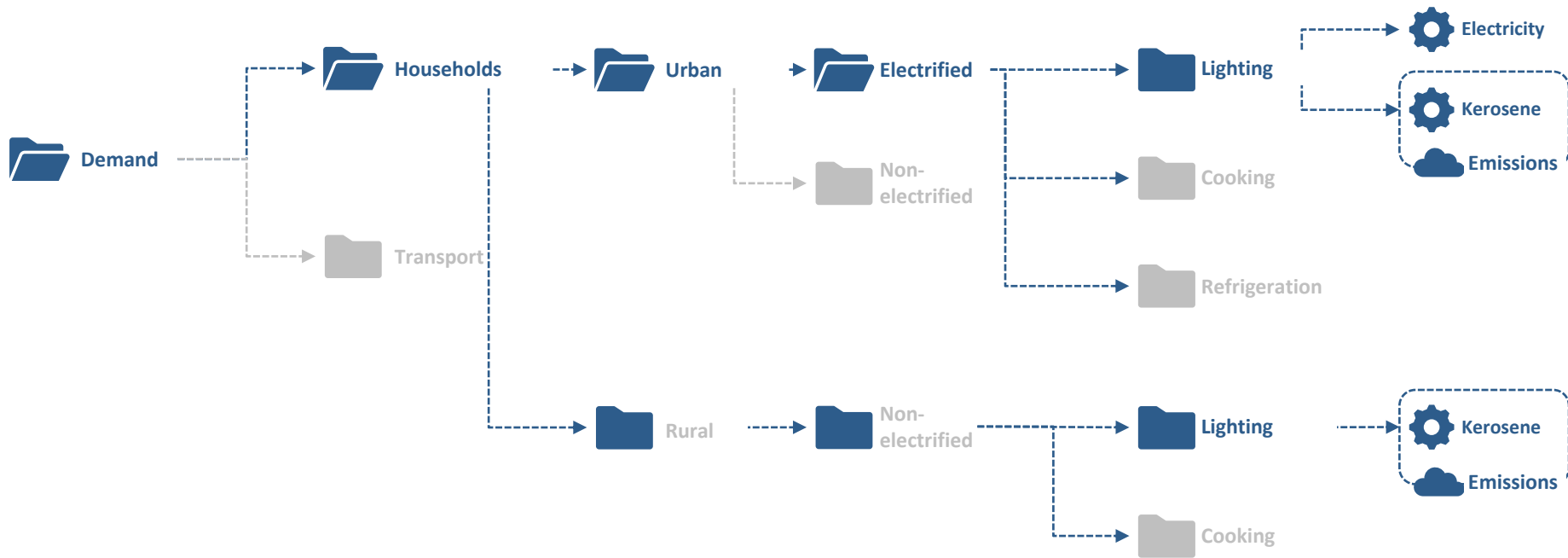


Basic structure of LEAP model: The Tree and its branches

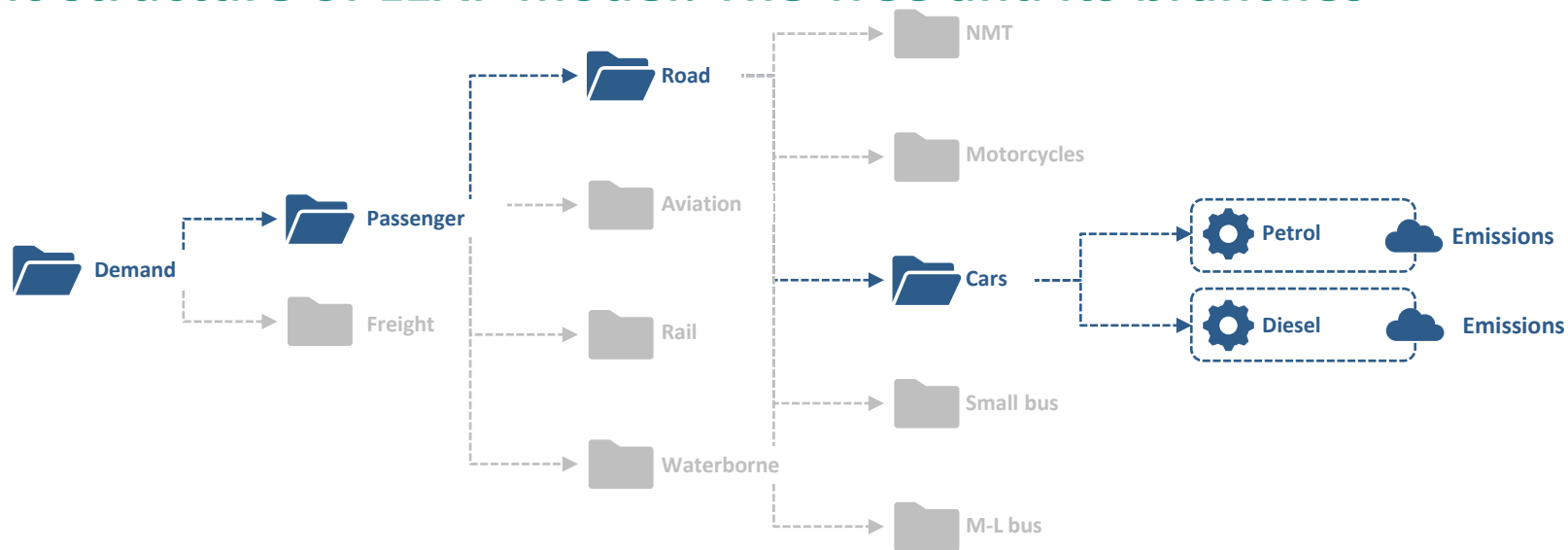




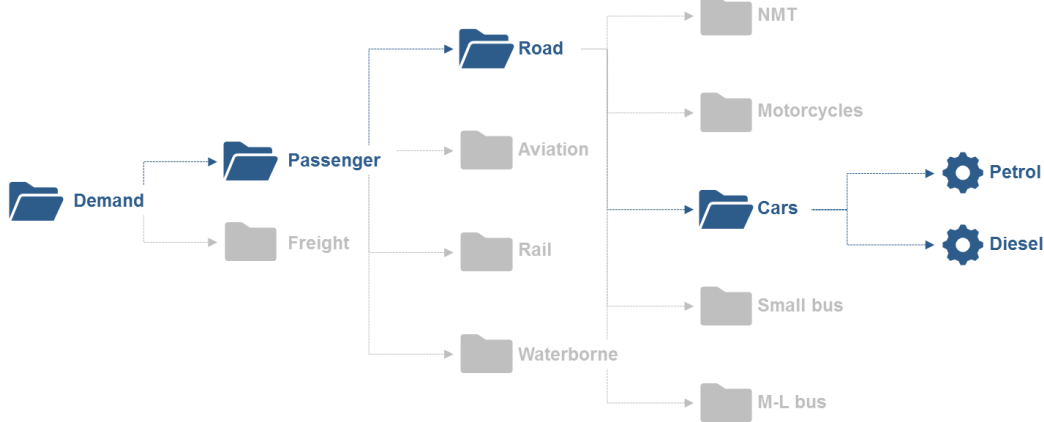
Basic structure of LEAP model: The Tree and its branches



Basic structure of LEAP model: The Tree and its branches



Basic structure of LEAP model: The Tree and its branches

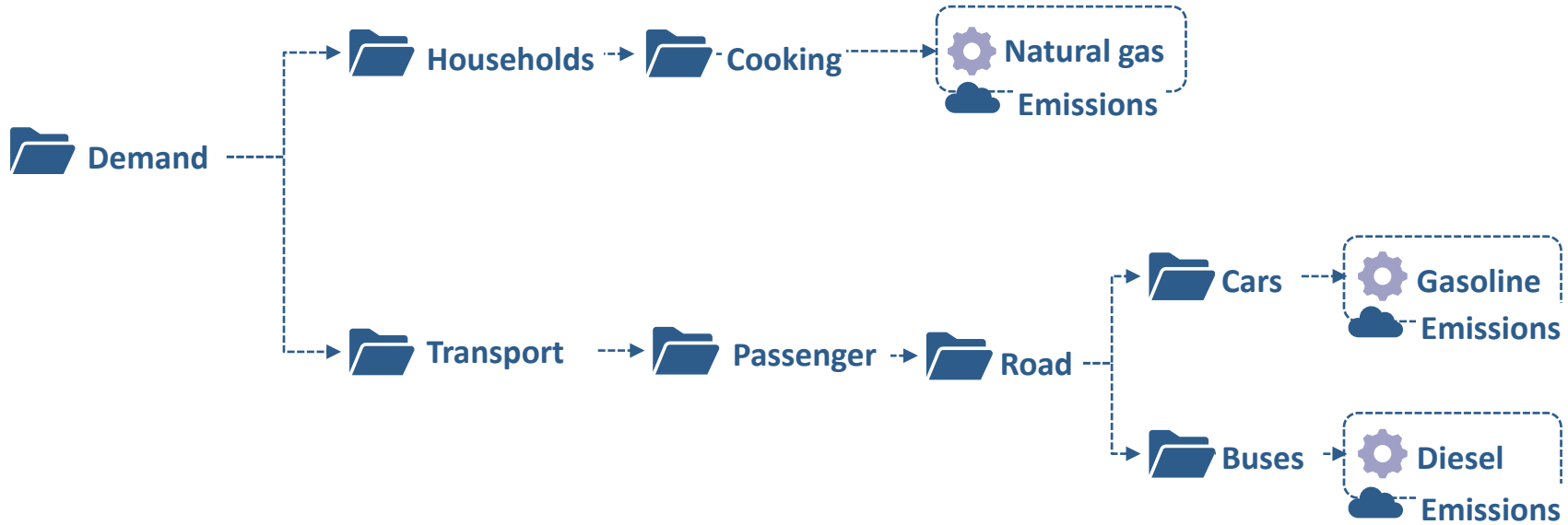


The screenshot shows the LEAP software interface for 'Uganda_Transport_Import_v2'. The interface includes a menu bar (Area, Edit, View, Analysis, Tags, General, Tree, Chart, Advanced, Help) and a toolbar with various icons. The main window displays a hierarchical tree structure:

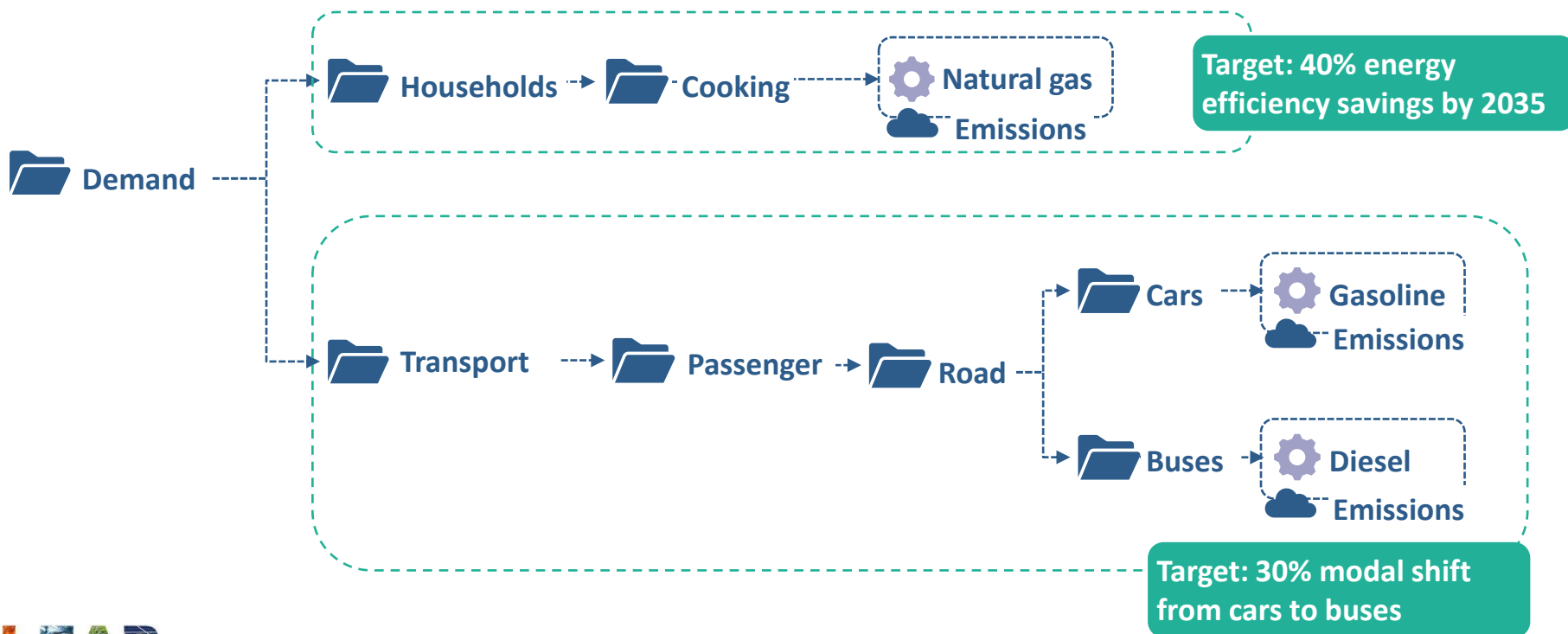
- Uganda_Transport
 - Key Assumptions
 - Demand
 - Transport_UG_EB
 - Transport_UG_VKM
 - Passenger
 - Road
 - NMT
 - Motorcycles
 - Cars
 - Petrol
 - Diesel
 - Freight
 - Small bus
 - M-L bus
 - Transformation
 - Resources
 - Non Energy

The 'Energy Balance' section is highlighted, showing a list of energy sources: Gasoline, Diesel, Natural Gas, Biodiesel, Ethanol, and Electricity. The 'Summaries' section shows a list of transport modes: Small bus_Matatu, Medium and large bus, Aviation, Rail, and Waterborne.

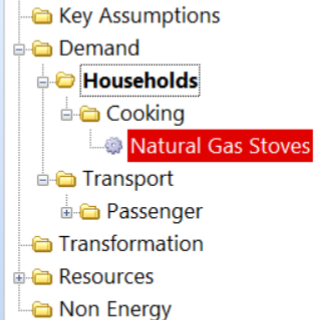
Basic structure of LEAP model: The Tree and its branches



Basic structure of LEAP model: The Tree and its branches



Pretoria LEAP Exercise

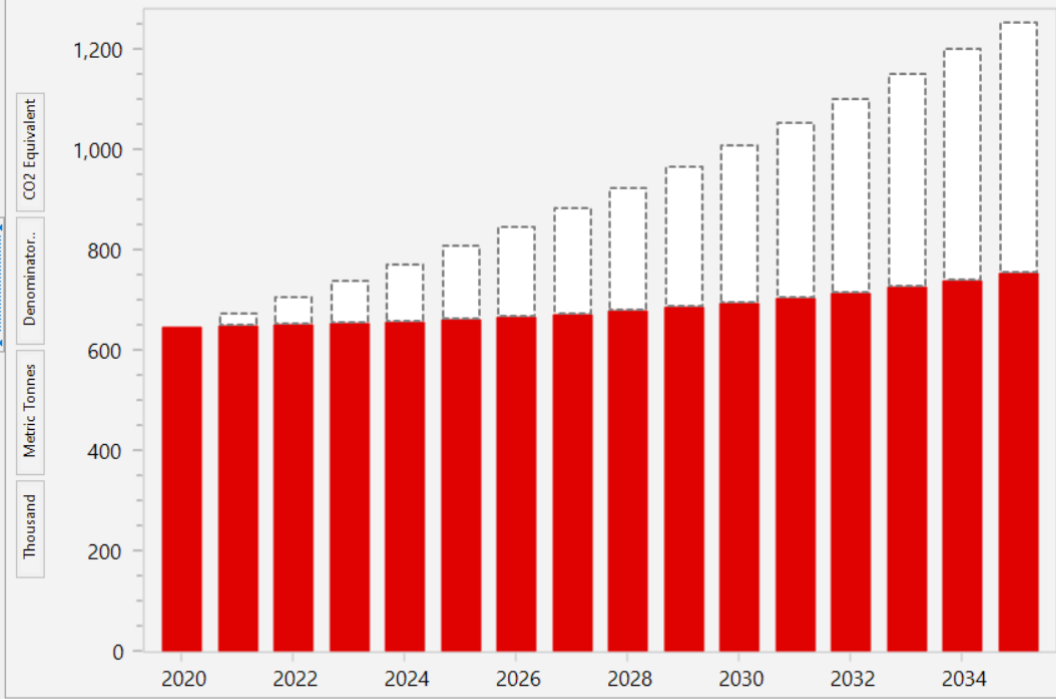


Levels: 2 Match Names Subtotals Scenario: Mitigation All Fuels All GHGs Less...

Absolute Values AVOIDED vs. Baseline Group Small in Legend Second Variable..

Chart Table Split

100-Year GWP: Direct (At Point of Emissions)



All Branches

- Avoided vs. Baseline
- Cooking, Natural Gas Stoves

All Years

Pretoria LEAP Exercise

- Key Assumptions
- Demand
 - Households
 - Cooking
 - Transport**
 - Passenger
 - Cars**
 - Buses
- Transformation
- Resources
- Non Energy

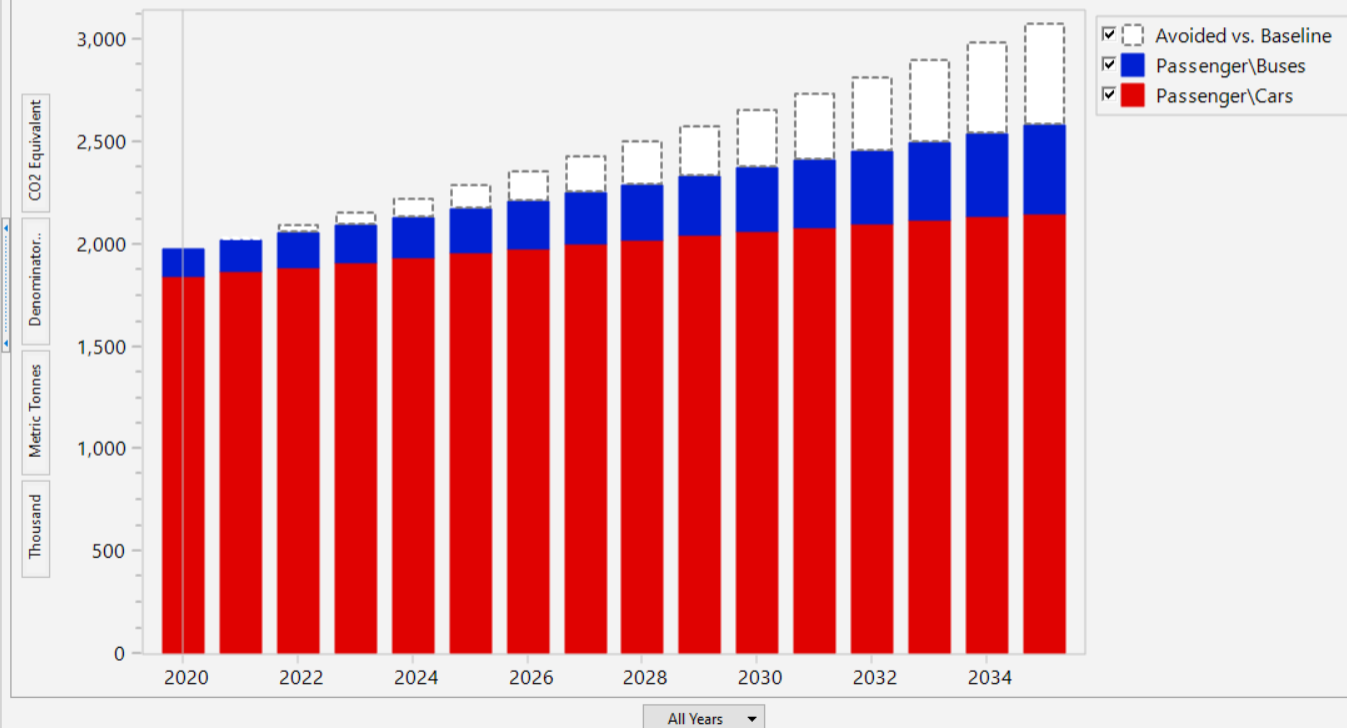
- Analysis
- Results
- Energy Balance
- Summaries
- Overviews
- Technology Database
- Notes

 Levels: 2 Match Names Subtotals Scenario: Mitigation All Fuels All GHGs Less...

 Absolute Values Avoided vs. Baseline Group Small in Legend Second Variable..

Chart Table Split

100-Year GWP: Direct (At Point of Emissions) ?



Pretoria LEAP Exercise

- Key Assumptions
- Demand
 - Households
 - Cooking
 - Natural Gas Stoves
 - Transport
 - Passenger
 - Transformation
 - Resources
 - Non Energy

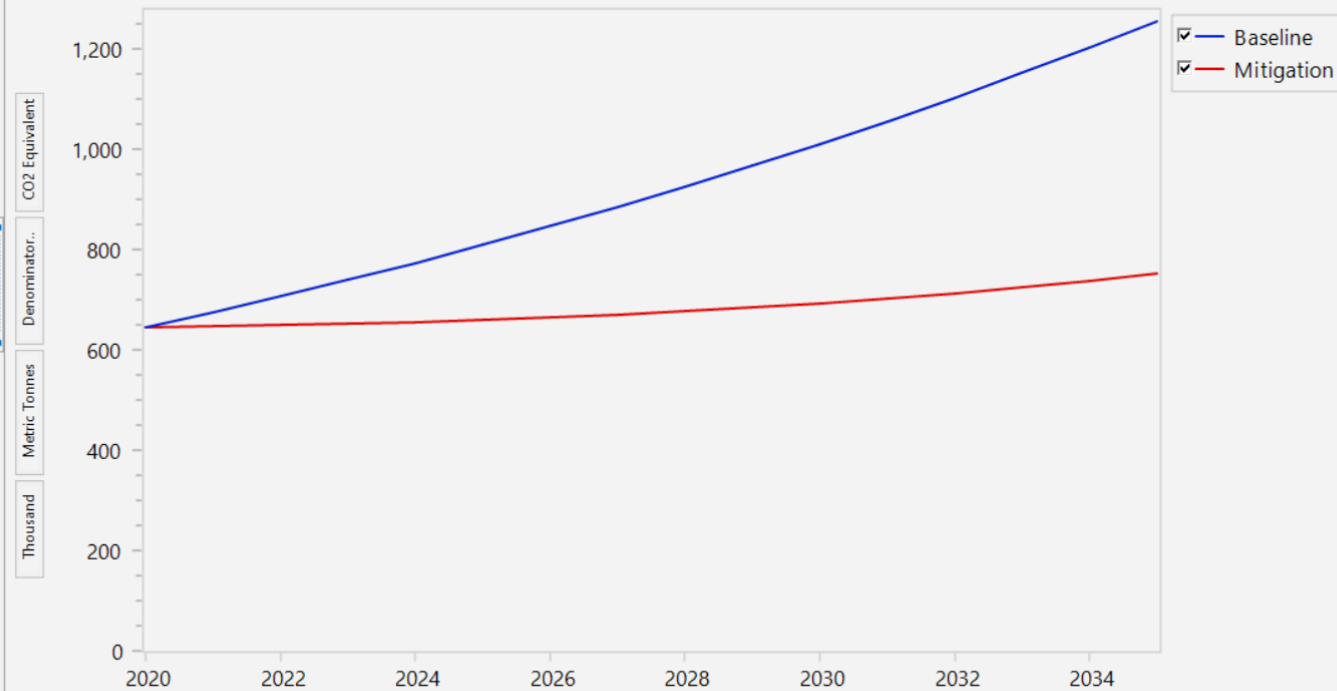
All Fuels ▾ All GHGs ▾ ⬆ Less...

Absolute Values ▾ No Comparison ▾ Second Variable..

Chart Table Split

100-Year GWP: Direct (At Point of Emissions) ▾

All Scenarios ▾



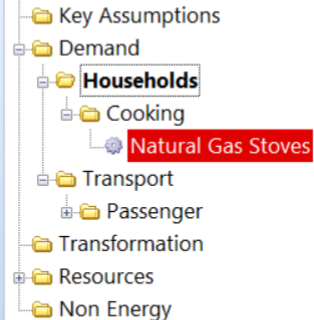
All Years ▾



7. Information on projections of greenhouse gas emissions and removals under a 'with measures' scenario^{a,b}

| | <i>Most recent year in the Party's national inventory report (kt CO₂ eq)^c</i> | | | |
|---|---|-----------|-----------|-----------|
| | <i>Projections of GHG emissions and removals, (kt CO₂ eq)^c</i> | | | |
| | 20XX | 20X(0)(5) | 20X(0)(5) | 20X(0)(5) |
| Sector^d | | | | |
| Energy | | | | |
| Transport | | | | |
| Industrial processes and product use | | | | |
| Agriculture | | | | |
| LULUCF | | | | |
| Waste | | | | |
| Other (specify) | | | | |
| Gas | | | | |
| CO ₂ emissions including net CO ₂ from LULUCF | | | | |
| CO ₂ emissions excluding net CO ₂ from LULUCF | | | | |
| CH ₄ emissions including CH ₄ from LULUCF | | | | |
| CH ₄ emissions excluding CH ₄ from LULUCF | | | | |
| N ₂ O emissions including N ₂ O from LULUCF | | | | |
| N ₂ O emissions excluding N ₂ O from LULUCF | | | | |
| HFCs | | | | |
| PFCs | | | | |
| SF ₆ | | | | |
| NF ₃ | | | | |
| Other (specify) | | | | |
| Total with LULUCF | | | | |
| Total without LULUCF | | | | |

Pretoria LEAP Exercise

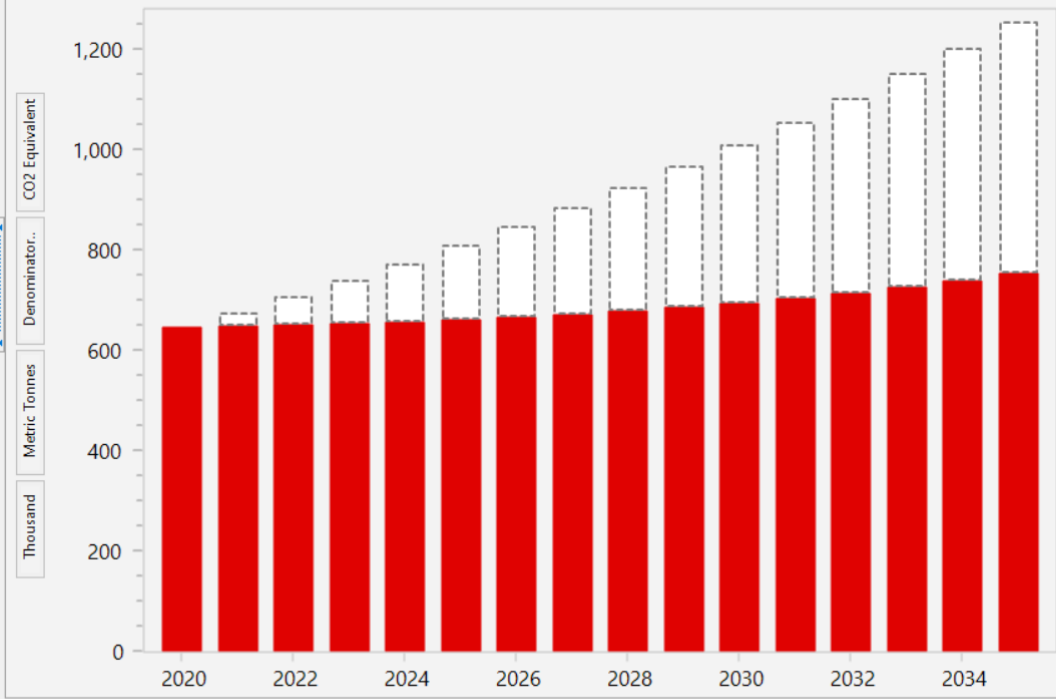


Levels: 2 Match Names Subtotals Scenario: Mitigation All Fuels All GHGs Less...

Absolute Values AVOIDED vs. Baseline Group Small in Legend Second Variable..

Chart Table Split

100-Year GWP: Direct (At Point of Emissions)



All Branches

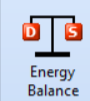
- Avoided vs. Baseline
- Cooking, Natural Gas Stoves



Analysis



Results



Energy Balance



Summaries



Overviews



Technology Database



Notes

Pretoria LEAP Exercise

Key Assumptions

Demand

Households

Cooking

Transport

Passenger

Cars

Buses

Transformation

Resources

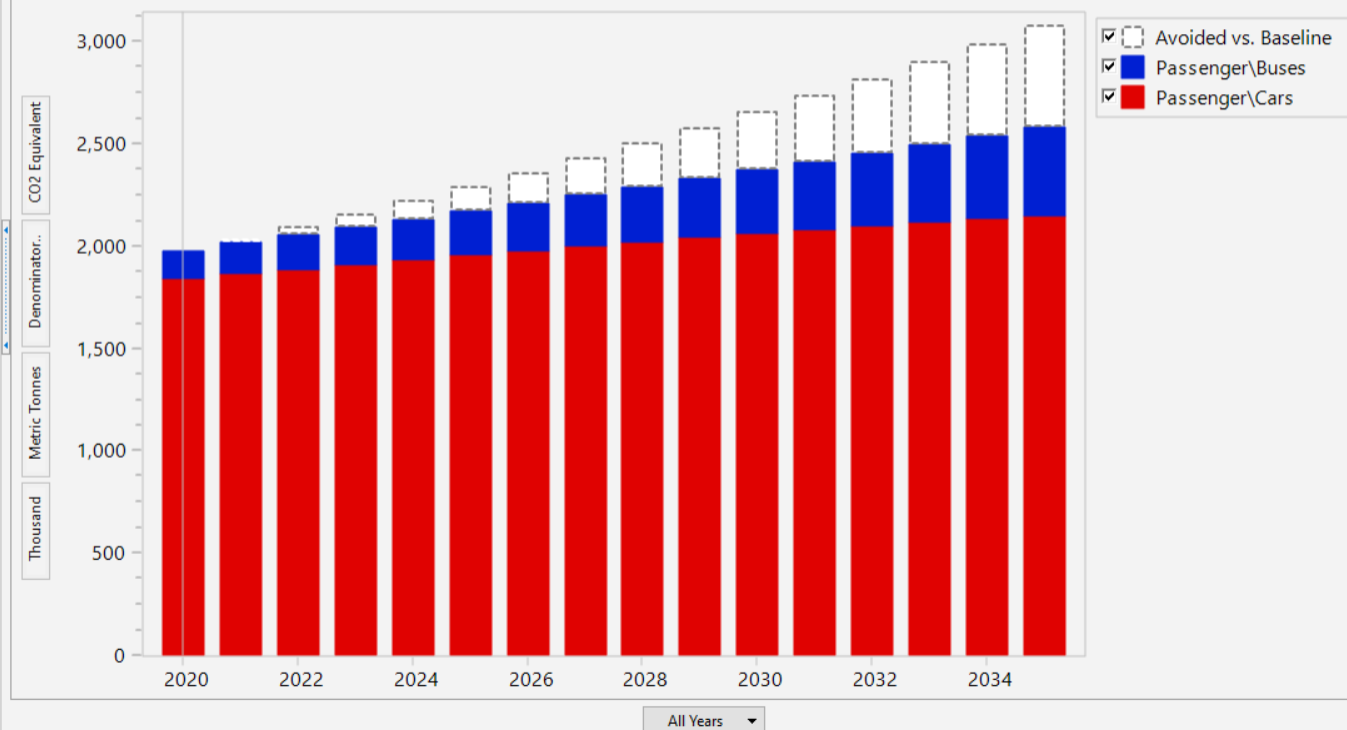
Non Energy

Levels: 2 Match Names Subtotals Scenario: Mitigation All Fuels All GHGs Less...Absolute Values Avoided vs. Baseline Group Small in Legend Second Variable..

Chart Table Split

100-Year GWP: Direct (At Point of Emissions) ?

All Branches



Pretoria LEAP Exercise

- Key Assumptions
- Demand
 - Households
 - Cooking
 - Natural Gas Stoves
 - Transport
 - Passenger
 - Transformation
 - Resources
 - Non Energy

Analysis

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Energy Balance

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All Fuels ▾ All GHGs ▾ ⬆ Less...

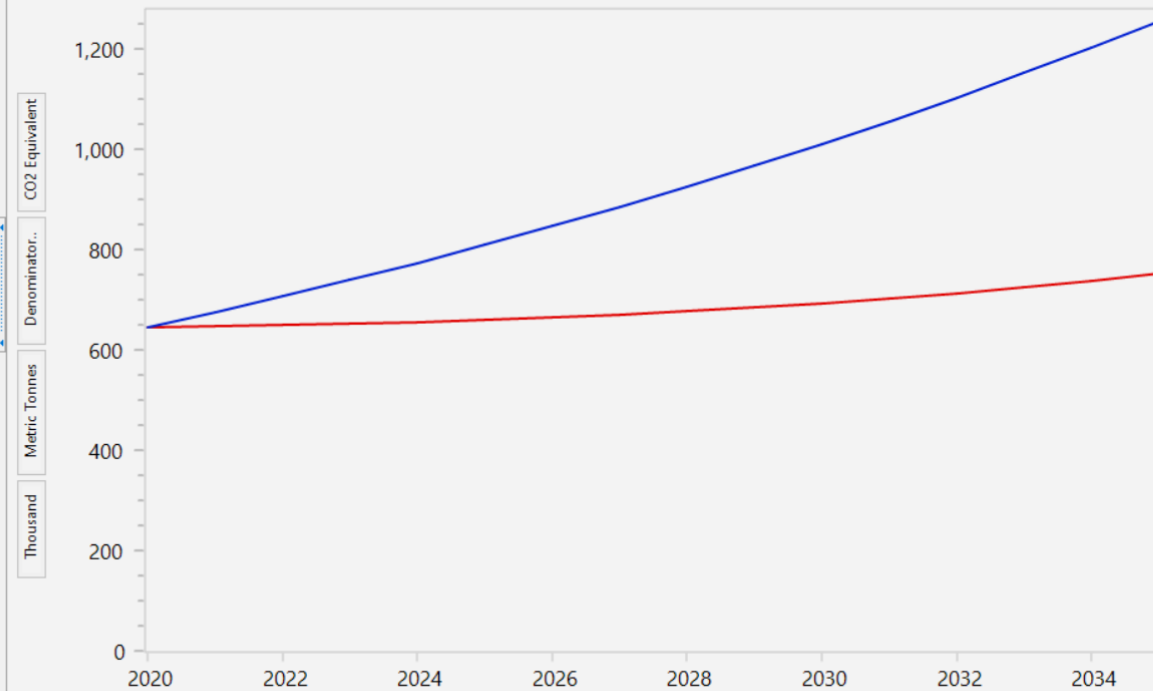
Absolute Values ▾ No Comparison ▾

 Second Variable..

Chart Table Split

100-Year GWP: Direct (At Point of Emissions) ▾

All Scenarios ▾



All Years ▾



Analysis



Results



Energy Balance



Summaries



Overviews



Technology Database



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Pretoria LEAP Exercise

- Key Assumptions
 - Demand
 - Households
 - Cooking
 - Transport
 - Passenger
 - Transformation
 - Resources
 - Non Energy

All Fuels ▾ All GHGs ▾ ↑ Less...

Absolute Values ▾ No Comparison ▾ Second Variable..
 Chart Table Split

100-Year GWP: Direct (At Point of Emissions) ▾

All Scenarios ▾

| Scenario | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | Total |
|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|----------|
| Baseline | 2,621.8 | 2,711.5 | 2,804.2 | 2,900.1 | 2,999.2 | 3,101.6 | 3,207.5 | 3,316.9 | 3,430.1 | 3,547.0 | 3,667.8 | 34,307.7 |
| Mitigation | 2,621.8 | 2,661.1 | 2,701.4 | 2,742.6 | 2,784.9 | 2,828.2 | 2,872.6 | 2,918.2 | 2,965.0 | 3,013.1 | 3,062.7 | 31,171.5 |
| Total | 5,243.5 | 5,372.6 | 5,505.6 | 5,642.7 | 5,784.1 | 5,929.8 | 6,080.1 | 6,235.1 | 6,395.1 | 6,560.1 | 6,730.5 | 65,479.2 |

CO2 Equivalent

Denominator..

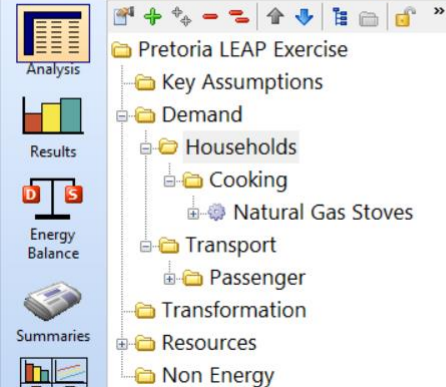
Metric Tonnes

Thousand

Every Twenty Years ▾

11. Key underlying assumptions and parameters used for projections^{a,b}

| Key underlying assumptions and parameters: ^c | Unit, as applicable | <i>Most recent year in the Party's national inventory report, or the most recent year for which data is available</i> | <i>Projections of key underlying assumptions and parameters^d</i> | | |
|---|---------------------|---|---|-----------|-----------|
| | | 20XX | 20X(0)(5) | 20X(0)(5) | 20X(0)(5) |
| {Key underlying assumption/parameter} | | | | | |



Branch: Demand: Households...

Branch: All Branches Variable: Activity Level Scenario: BAS: Baseline

Activity Level

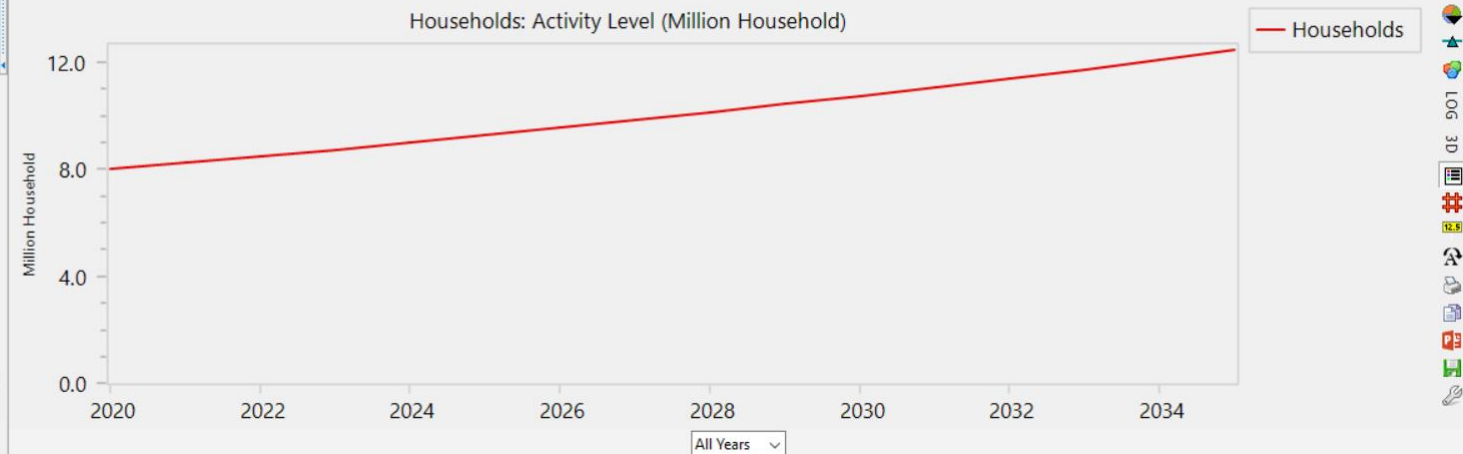
Activity Level: A measure of the social or economic activity for which energy is consumed. [Default="0"]

| Branch | 2020 Value | Expression | Scale | Units | Per |
|------------|------------|------------|---------|-----------|--------------|
| Households | 8.00 | Growth(3%) | Million | Household | |
| Cooking | 100.00 | 100 | Percent | Share | of Household |

Expression OK Check as You Type

Chart Table Builder Notes Elaboration Help

Show: Activity Level

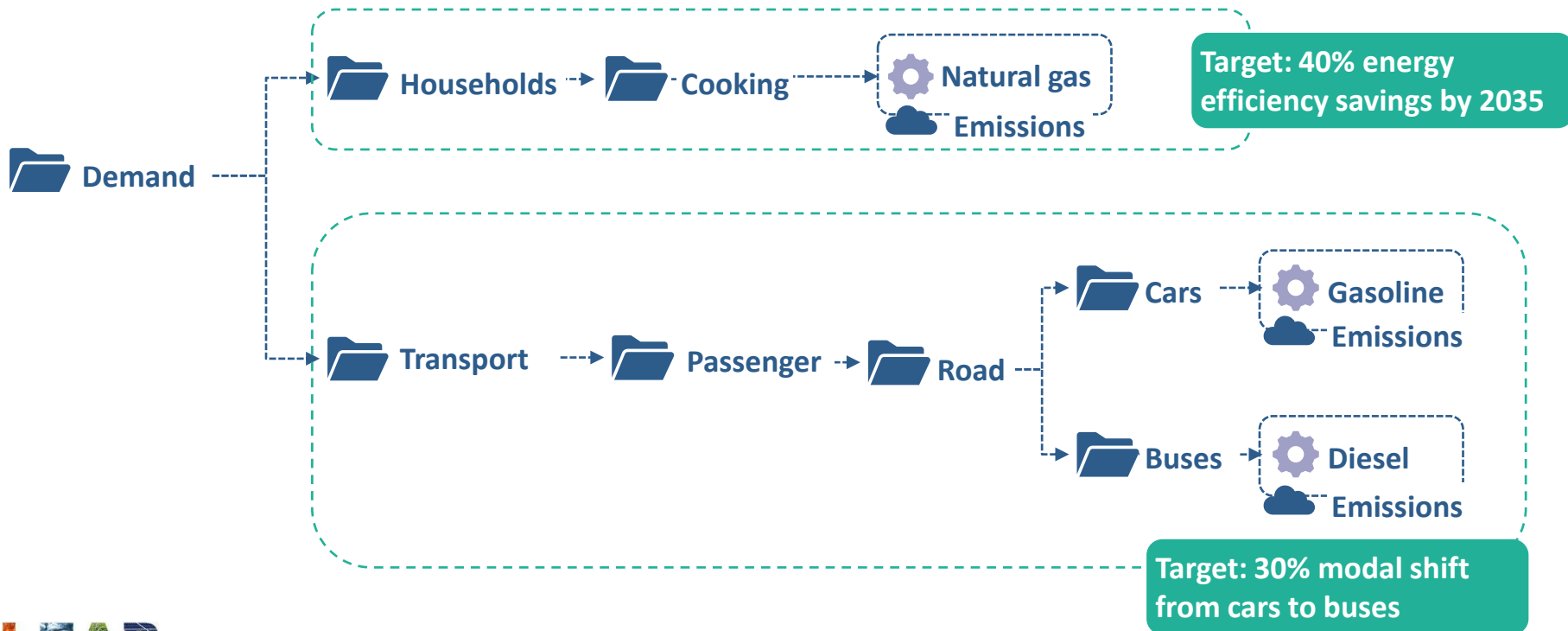


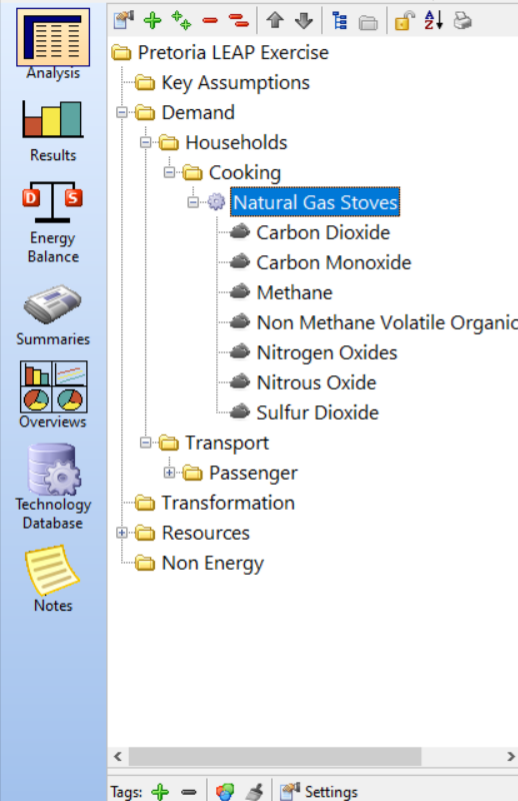
10. Projections of key indicators^{a,b}

| Key indicator(s): ^c | Unit, as applicable | <i>Most recent year in the Party's national inventory report, or the most recent year for which data is available</i> | | | |
|--------------------------------|---------------------|---|-----------|-----------|-----------|
| | | <i>Projections of key indicators^d</i> | | | |
| | | 20XX | 20X(0)(5) | 20X(0)(5) | 20X(0)(5) |
| {Key indicator} | | | | | |



Basic structure of LEAP model: The Tree and its branches





Branch: Demand\Households\Cooking\Natural Gas Stoves\...

Branch: All Branches Variable: Final Energy Intensity Scenario: BAS: Baseline

Activity Level Final Energy Intensity Avg Environmental Loading All Variables

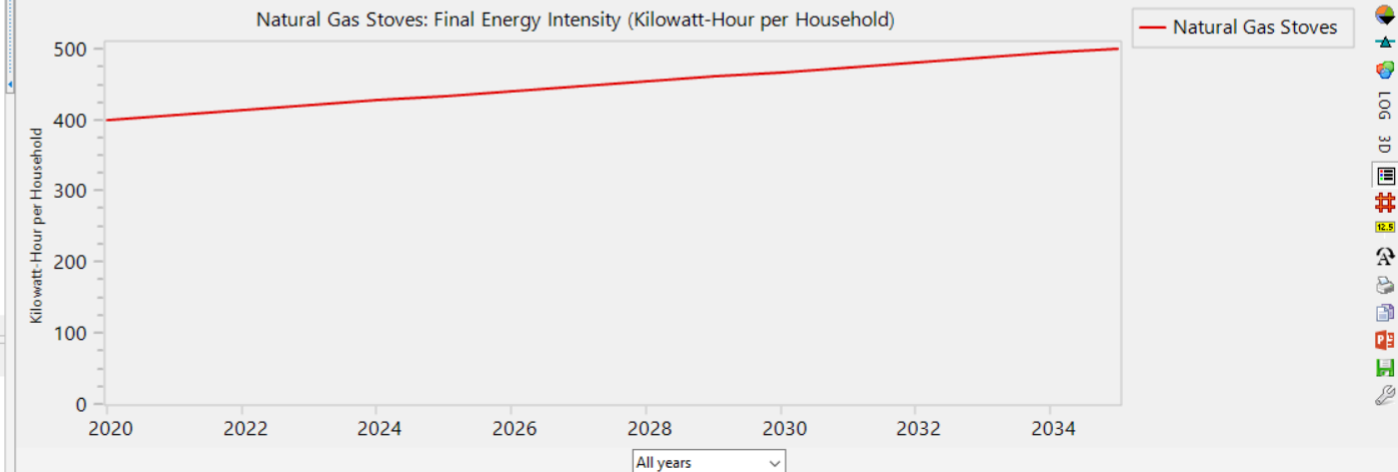
Final Energy Intensity: Annual final consumption of energy per unit of activity level. [Default="0"]

| Branch | Fuel | 2020 Value | Expression | Scale | Units | Per |
|----------------------|-------------|------------|------------------|-------|---------------|---------------|
| ► Natural Gas Stoves | Natural Gas | 400.00 | Interp(2035,500) | | Kilowatt-Hour | per Household |

Expression OK Check as You Type

Chart Table Builder Notes Elaboration Help

Show: Final Energy Intensity Units: Kilowatt-Hour per Household



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Pretoria LEAP Exercise

- Key Assumptions
- Demand
 - Households
 - Cooking
 - Natural Gas Stoves**
 - Carbon Dioxide
 - Carbon Monoxide
 - Methane
 - Non Methane Volatile Organic
 - Nitrogen Oxides
 - Nitrous Oxide
 - Sulfur Dioxide
 - Transport
 - Passenger
 - Transformation
 - Resources
 - Non Energy

Tags: + - Settings

Branch: Demand\Households\Cooking\Natural Gas Stoves\...

Branch: All Branches Variable: Final Energy Ir Scenario: MIT: Mitigation

Activity Level Final Energy Intensity Avg Environmental Loading All Variables

Final Energy Intensity: Annual final consumption of energy per unit of activity level. [Default="0"]

| Branch | Fuel | 2020 Value | Expression | Scale | Units | Per |
|----------------------|-------------|------------|---|-------|---------------|---------------|
| ► Natural Gas Stoves | Natural Gas | 400.00 | $\text{Interp}(2035, \text{BaselineValue} * 0.6)$ | | Kilowatt-Hour | per Household |

Expression OK Check as You Type

Chart Table Builder Notes Elaboration Help

Show: Final Energy Intensity Units: Kilowatt-Hour per Household

