
Modeling Energy Demand

in LEAP

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Energy demand

- All energy delivered to final consumer*
 - Residential
 - Industrial
 - Services
 - Transport
 - Agricultural
 - Fishing
 - Non-specified
 - Non Energy use

* Eurostat definition

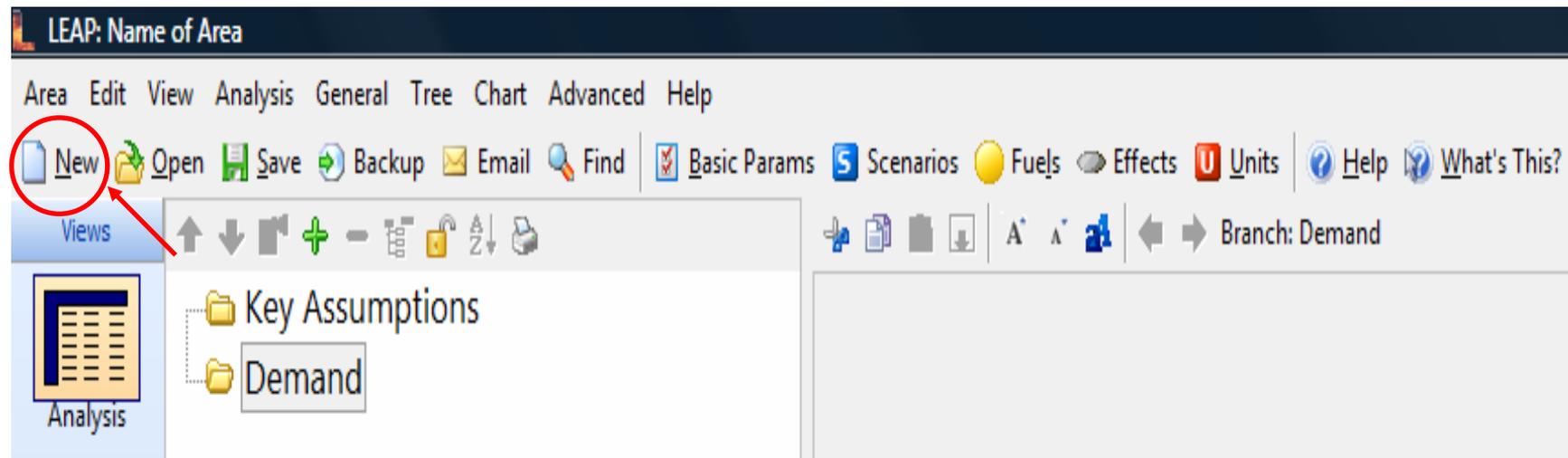


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Area creation (1/2)



- Go to the main toolbar
- Click on button “New”



Area creation (2/2)

New Area

Name:

Create area:

from default data

as a copy of area:

Password Protection (Optional)

Enter password:

Confirm password:

Required to Change Required to Open

- Name your New Area
- Set security password

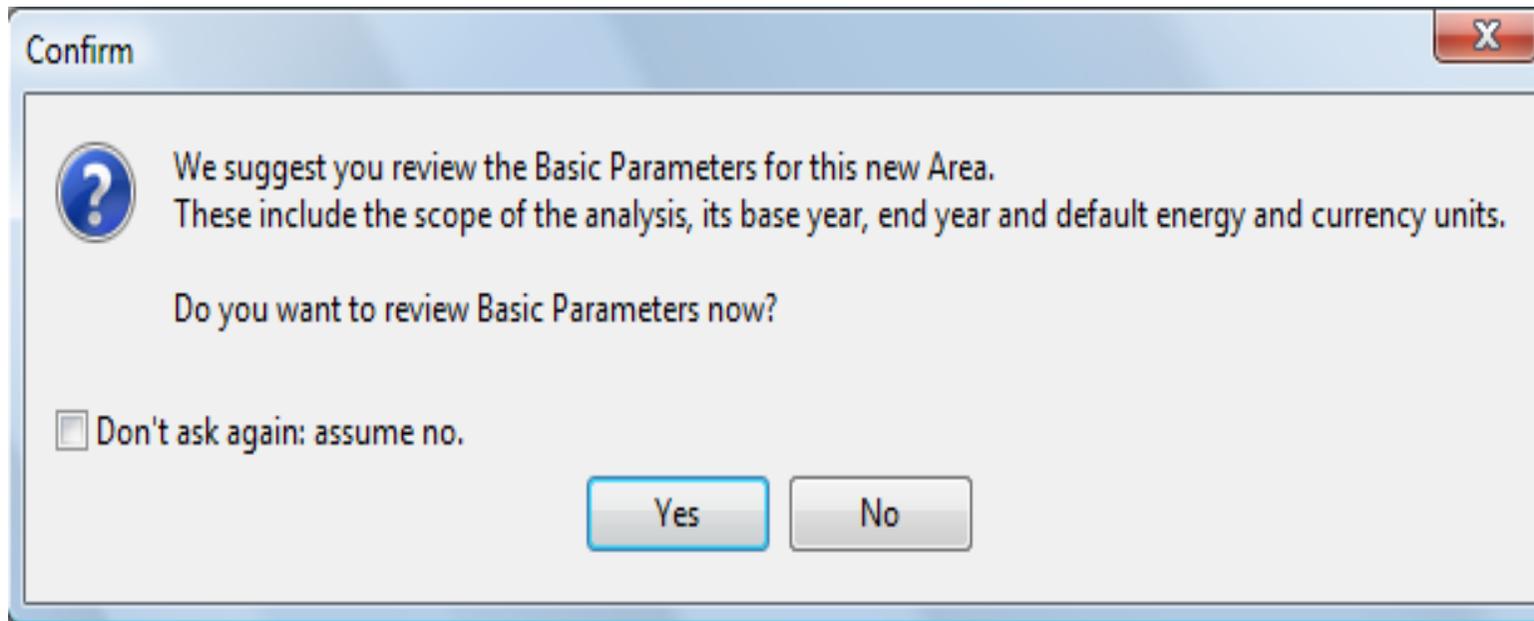


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Basic parameters (1/3)



Basic parameters (2/3)

X
Basic Parameters

Scope & Scale
Years
Default Units
Calculations
Optimization
Stocks
Internet
Charts
Folders
Security

Area

Name:

Description:

Scope

- Transformation & Resources
- Statistical Differences & Stock Changes
- Costs
- Energy Sector Environment Loadings
- Non-Energy Sector Environment Loadings
- Indicators
- [Edit List of Result Variables to Save](#)

Scale

Global

Multi-national

National

Sub-national

Country:

User Information: from COMMENT

Property	Value
Organization	KEPA
Organization Type	Academic Organization
City	Athens
Country	Greece
Email	promitheas@kepa.uo...
Web	http://www.kepa.uoa....
License Expires:	10/21/2016

[Visit COMMENT to edit your user profile](#)

✔ Close
? Help



Basic parameters (3/3)

- Define basic settings of analysis
 - Scope and scale
 - Base Year and End Year
 - Default units



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Basic Parameters

Scope & Scale | Years | Default Units | Calculations | Optimization | Stocks | Internet | Charts | Folders | Security

Area

Name: Name of Area

Description:

Scope

Transformation & Resources

Statistical Differences & Stock Changes

Costs

Energy Sector Environment Loadings

Non-Energy Sector Environment Loadings

Indicators

[Edit List of Result Variables to Save](#)

Scale

Global

Multi-national

National

Sub-national

Country

User Information: from COMMEND

Property	Value
Organization	KEPA
Organization Type	Academic Organization
City	Athens
Country	Greece
Email	promitheas@kepa.uo...
Web	http://www.kepa.uoa...
License Expires:	10/21/2016

[Visit COMMEND to edit your user profile](#)

Close Help

- Choose type of analysis
- Minimum: demand analysis
- Disable parts to speed-up calculations



Basic Parameters

Scope & Scale | **Years** | Default Units | Calculations | Optimization | Stocks | Internet | Charts | Folders | Security

Base Year: 2010 (First calculated year)

First Scenario Year: 2011 (First year in which scenario expressions used)

End Year: 2040 (Last calculated year)

Results Every: 1 years (must=1 for cost and stock turnover analyses)

Monetary Year: 2010 (Year to which all costs are discounted)

First Depletion Year: 2011 (First year in which reserves are depleted)

Count Costs to End Year

Last Year to Count Costs: 2030 (costs after this year will be ignored)

Default Time-Series Years:

1. 2040 2. 3. 4.

Close Help

- Base Year: first year for which there is data
- First Scenario Year: first year of scenario analysis
- End Year: last year of analysis



Basic Parameters

Scope & Scale | Years | **Default Units** | Calculations | Optimization | Stocks | Internet | Charts | Folders | Security

Energy Unit: Gigajoule

Monetary Unit: U.S. Dollar

Distance Unit: Kilometer

Standard Environmental Loading Reporting Units:

Energy Based: Kilogramme / Terajoule

Transport Based: Kilogramme / Vehicle-km

Close Help

- Basic default units
- Make use of other units
- Set your own units



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Tree branch / Properties

- Tree toolbar 
 - **Add (+)**, **Delete (-)** and **Properties (📁)** buttons
- Type of branches
 - **Category (📁)**
 - **Category with energy intensity (📁)**
 - **Technology with energy intensity (⚙️)**
 - **Technology with total energy (⚙️)**
 - **Key Assumption (K)**



Add Key Assumption branch

Branch Properties

Name: Cars

Branch Type:

 Category

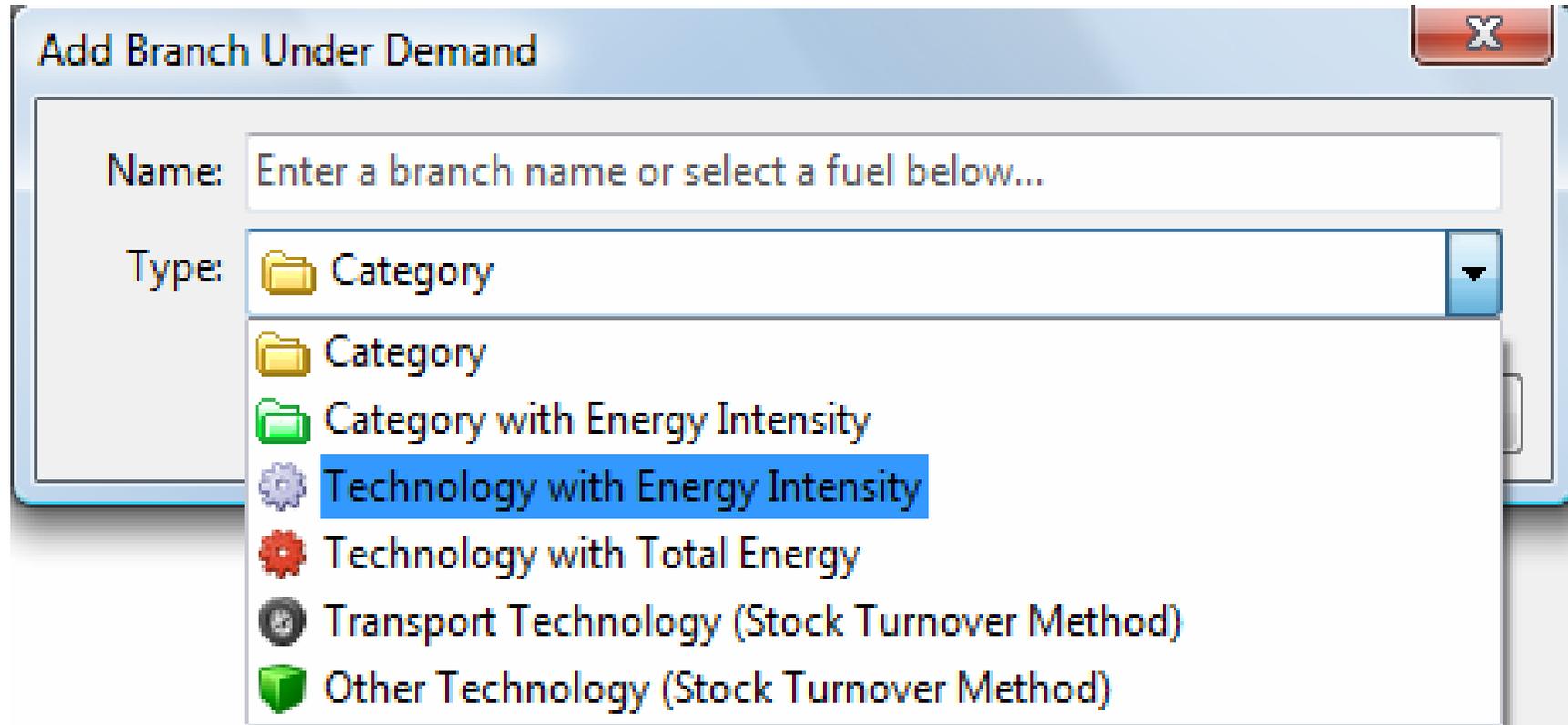
 Key Assumption

Units: Million

OK Cancel



Add Demand branch



Add Branch Under Demand

Name: Enter a branch name or select a fuel below...

Type:  Category

-  Category
-  Category with Energy Intensity
-  **Technology with Energy Intensity**
-  Technology with Total Energy
-  Transport Technology (Stock Turnover Method)
-  Other Technology (Stock Turnover Method)



Add Technology branch

Add Branch Under Demand

Name: Enter a branch name or select a fuel below...

Type: Technology with Energy Intensity

Options:

Fuel: Electricity

- Coal Sub bituminous
- Coal Unspecified
- Crude Oil
- Diesel
- Electricity
- Ethanol
- Gasoline
- Geothermal
- Hard Coal Briquettes
- Heat
- Hydro
- Hydrogen
- Jet Kerosene
- Kerosene

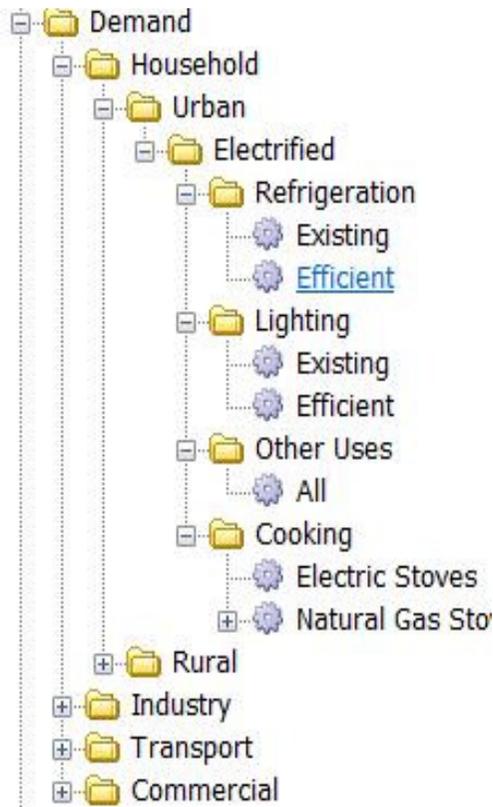


Technology branches

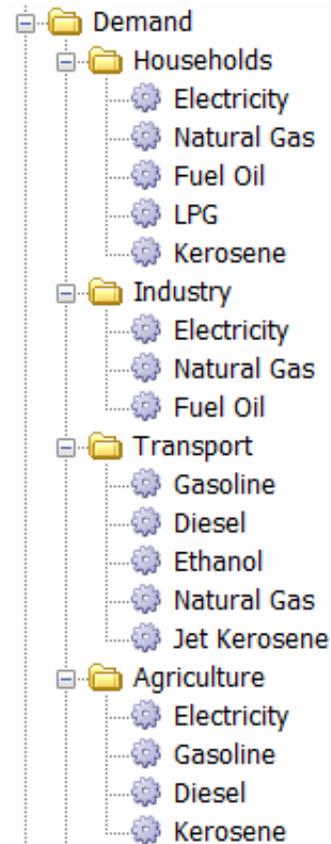
- Basic types of **Technology** branches :
 - **Activity Level Analysis**, in which energy consumption is calculated as the product of an activity level and an annual energy intensity (energy use per unit of activity).
 - **Stock Analysis**, in which energy consumption is calculated by analyzing the current and projected future stocks of energy-using devices, and the annual energy intensity of each device.
 - **Transport Analysis**, in which energy consumption is calculated as the product of the number of vehicles, the annual average distance traveled per vehicle and the fuel economy of the vehicles.



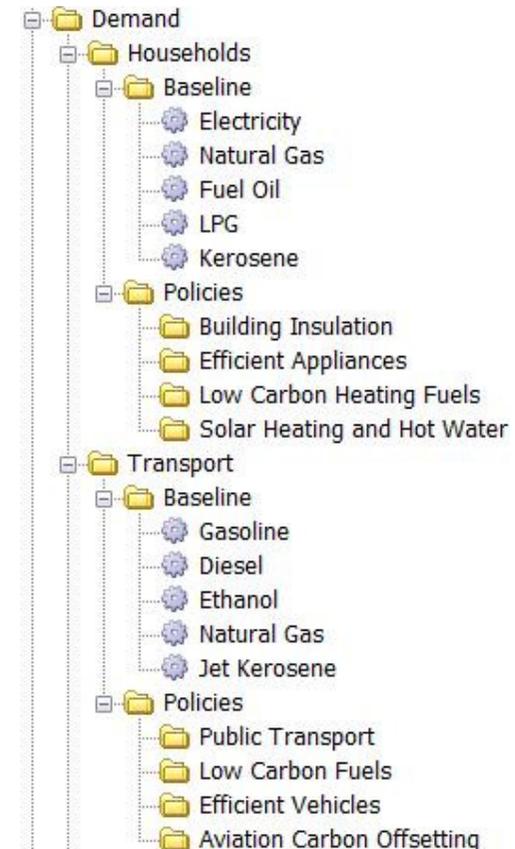
Tree branch / Structure (1/2)



Bottom-up



Top-down



Hybrid



Tree branch / Structure (2/2)

- **Bottom-up**
 - Detailed end-use approach
 - Data intensive
 - Impacts of technology-based policies
- **Top-down**
 - Aggregate approach
 - Less data intensive than bottom-up
 - Impacts of fiscal policies
- **Hybrid**
 - Less data intensive than bottom-up
 - Limited to cases when measures are small vs baseline

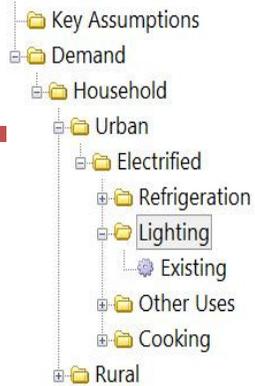


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Data entry table



Activity Level Final Energy Intensity

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

Branch	Expression	Scale	Units	Per
Household	8	Million	Household	
Urban	30	Percent	Share	of Households
Electrified	100	Percent	Saturation	of Households
Lighting	100	Percent	Saturation	of Households
Existing	Remainder(100)	Percent	Share	of Households

Top pane: View and edit the data associated with the variables at each branch

Expression OK Check as You Type

Chart Table Builder Notes Elaboration Help

Show: Intensity

Existing: Activity Level (% Share of Households)

Bottom pane: Display Chart/Table/Notes



Historical data input

- Current Accounts
- Data requirements
 - Demographic
 - Economic
 - Energy demand
 - Activity level: measure of economic activity in sector
 - Energy intensity: final energy consumption/activity level
- Different ways of inserting historical data
 - Manually
 - [Excel file](#)



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- Key Assumptions
- Effects
- Demand
 - Households and Services
 - Agriculture
 - Industry
 - Transport
 - Non Energy Use
- Statistical Differences
- Transformation
- Stock Changes
- Resources
- Non Energy

The screenshot shows the LEAP software interface. The main window is titled 'Final Energy Intensity' and displays a table with columns 'Branch' and 'Expression'. The 'All' branch is selected, and its expression is 'Interp(turkey_database.xls;c297:d317)'. A 'Function Wizard' dialog box is open, showing the 'Interp' function selected. The 'Preview' section shows the result: 'Interp(turkey_database.xls;c297:d317) = 15357894,23 in 1990'. The 'Parameters' section shows 'Parameter 1: turkey_database.xls;c297:d317'. The wizard also includes options for 'Time Series Wizard', 'LEAP Branch/Variable', and 'Excel Sheet/Range'.

- Save the Excel file in the folder **LEAP Areas**
- Go to Current Accounts
- Use the Function Wizard
- Define range parameters



National official data sources

- Statistical service
- Ministries relevant with:
 - energy/industry
 - environment
 - agriculture
- Public energy companies
- Regulatory authorities/committees



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International official data sources

- World Bank
- International Energy Agency (IEA)
- United Nations (UN)
- Eurostat
- European Environmental Agency (EEA)



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Let's practice!

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