

# Modeling Energy Demand *in LEAP*

Anna Flessa, Dipl. Ing., MSc.  
Research associate, KEPA



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# Energy demand

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

\* Eurostat definition

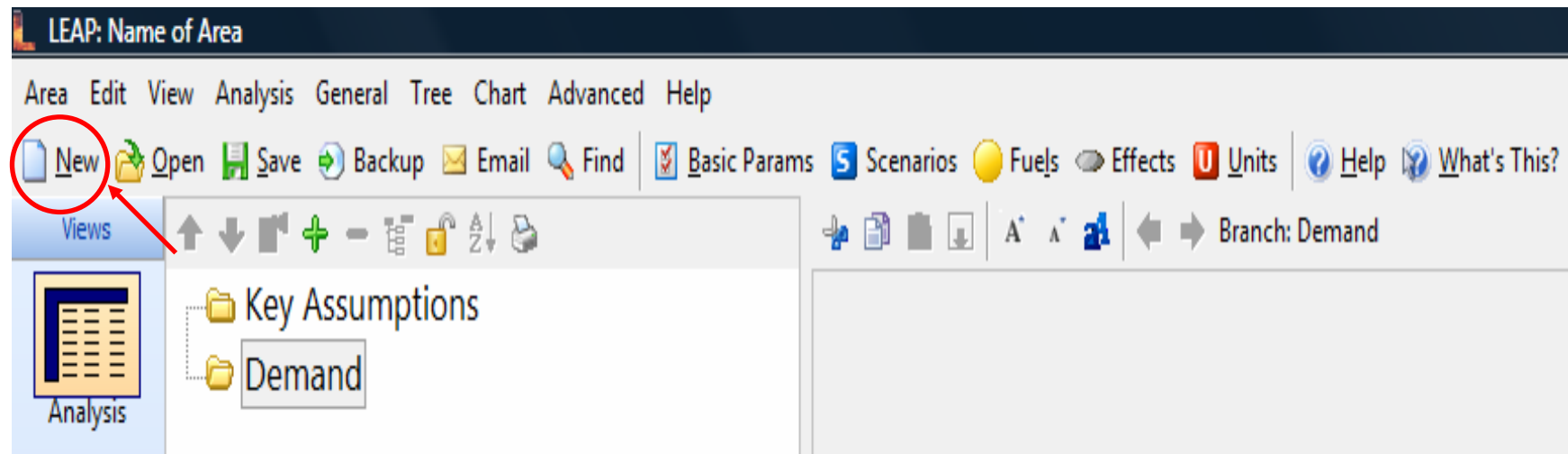


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# Area creation (1/2)



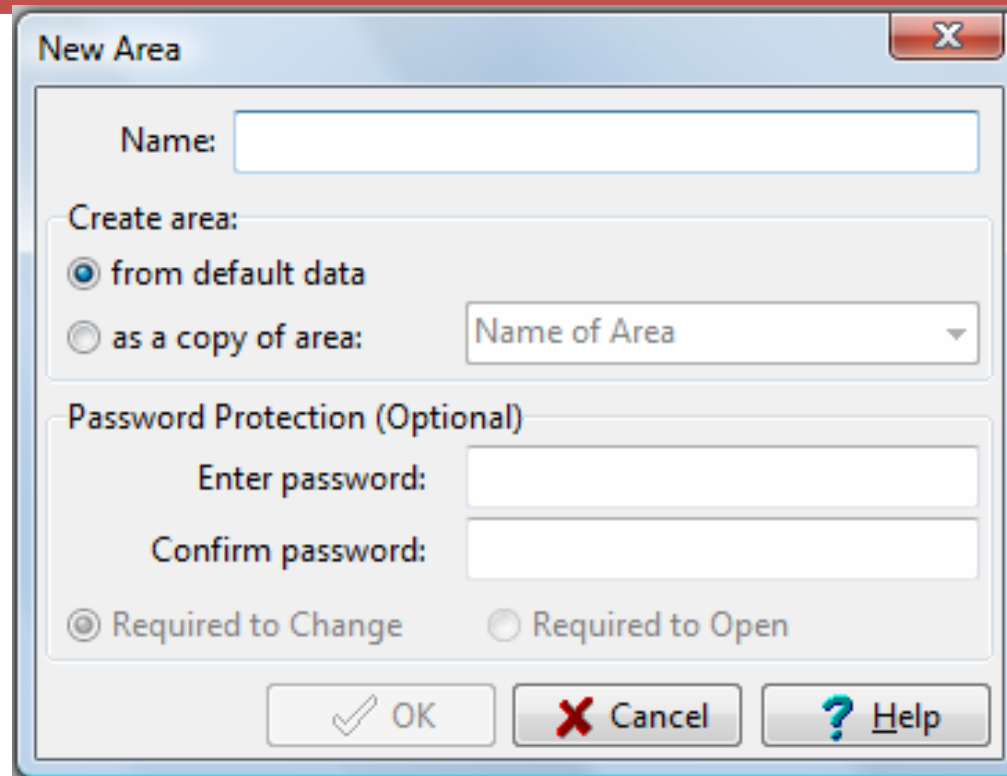
- Go to the main toolbar
- Click on button “New”



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# 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

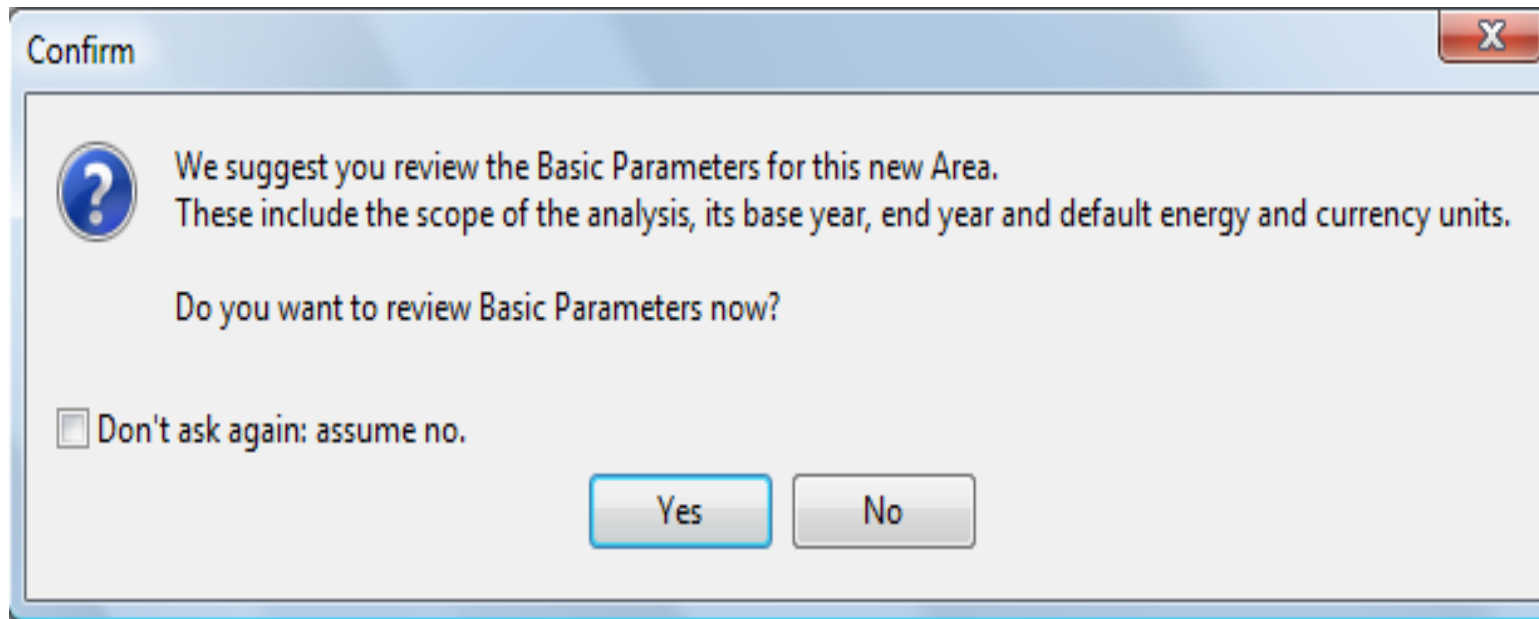
- Name your New Area
- Set security password



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# Basic parameters (1/3)

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# Basic parameters (2/3)

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 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



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# Basic parameters (3/3)

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- 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

[V 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



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**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



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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


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- 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** (folder with plus) buttons
- Type of branches
  - **Category** (folder)
  - **Category with energy intensity** (folder with green plus)
  - **Technology with energy intensity** (gear)
  - **Technology with total energy** (red gear)
  - **Key Assumption** (blue K)



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# Add Key Assumption branch

**Branch Properties**



Name:

Branch Type:

 ☐ Category

 ☒ Key Assumption

Units:

 OK  Cancel



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# Add Demand branch

**Add Branch Under Demand**

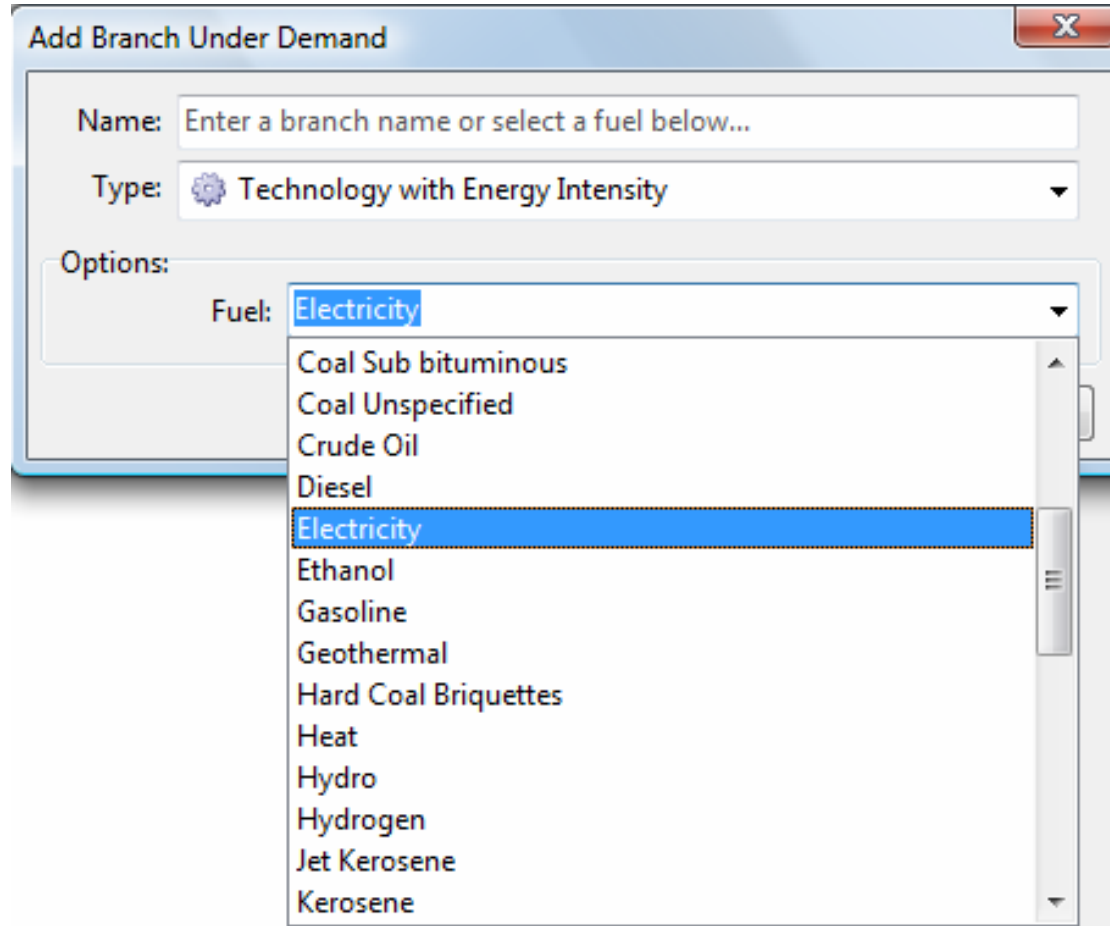
Name: Enter a branch name or select a fuel below...

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



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# Technology branches

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- 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.



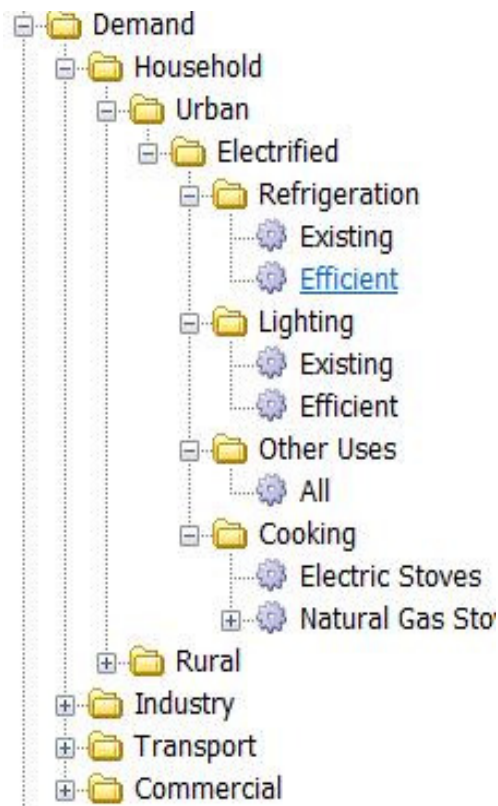
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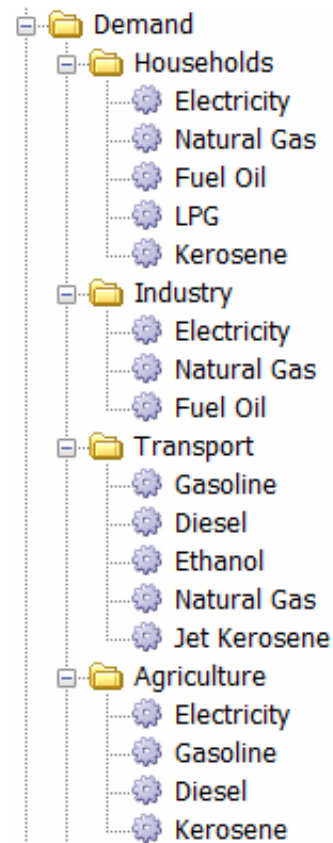
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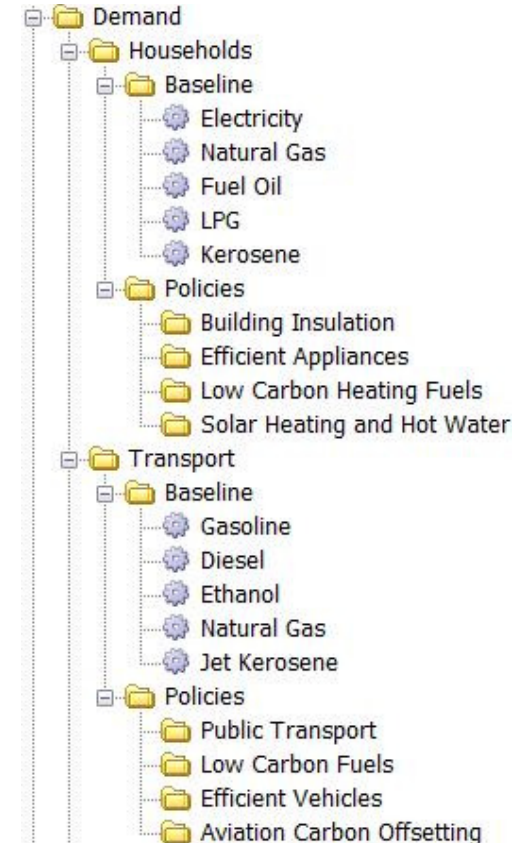
# Tree branch / Structure (1/2)



Bottom-up



Top-down



Hybrid



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# Tree branch / Structure (2/2)

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- **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

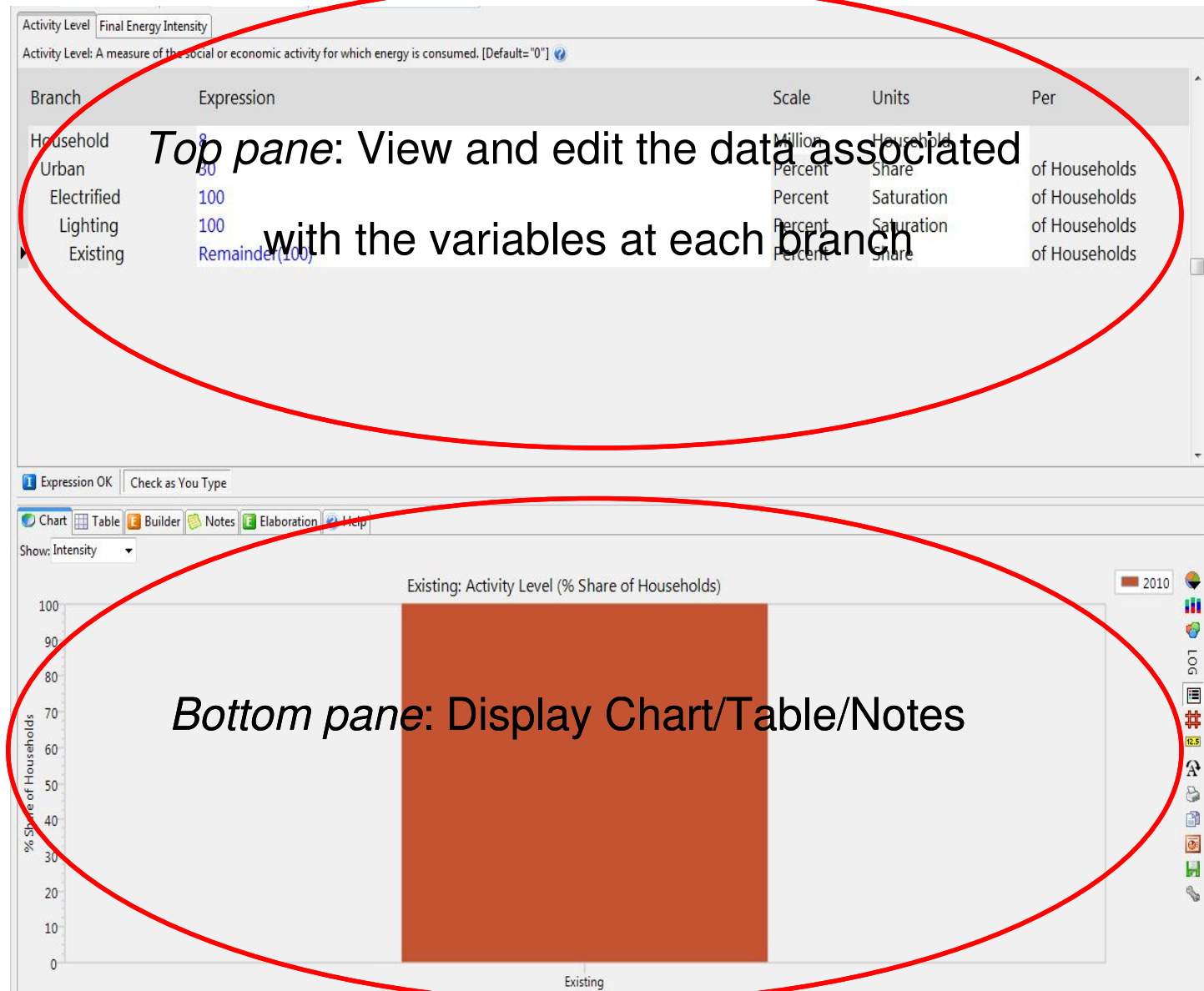
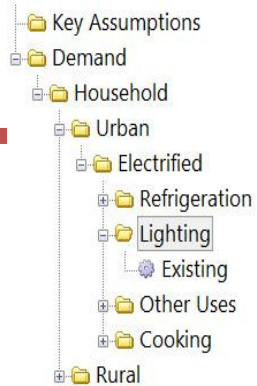


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# Data entry table



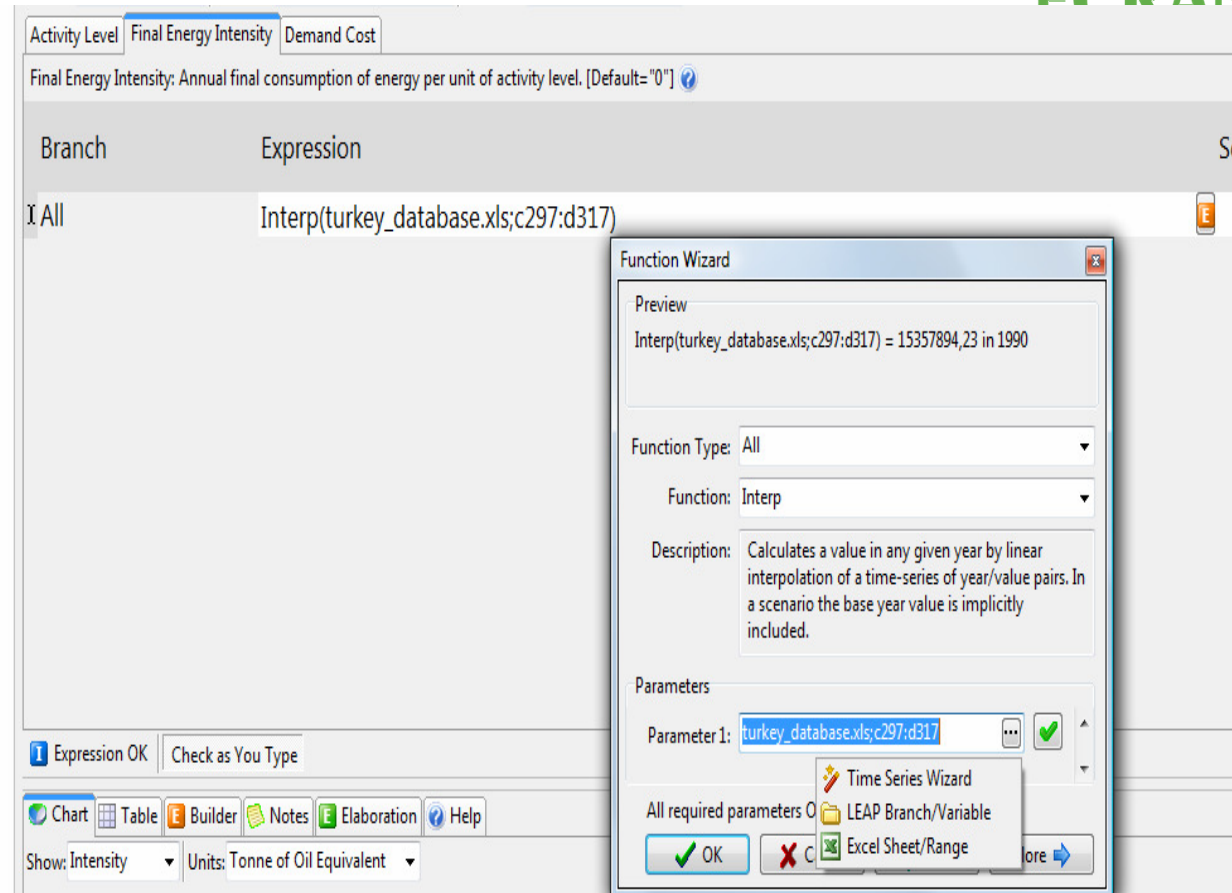
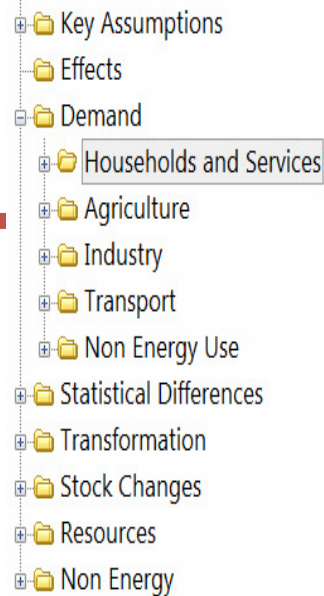
# Historical data input

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



# National official data sources

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



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# International official data sources

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- 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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Anna Flessa

Energy Policy and Development Centre (KEPA)

National and Kapodistrian University of Athens

Tel.: +30 210 7275732

E-mail: [aflessa@kepa.uoa.gr](mailto:aflessa@kepa.uoa.gr)



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