

Scenario analysis *in LEAP*

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 - Use of expressions
- Show Results
 - Eight (8) steps to view/edit/export



Basics

Scenario analysis: a method for decision-making

Scenarios

- are self-consistent story-lines of how an energy system might evolve over time in a particular socio-economic and policy setting.
- encompass any factor that can change over time, because of particular policy interventions and different socio-economic conditions.
- share a common set of *Current Accounts* data.
- run from the First Scenario Year to the End Year of the study.



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Add scenarios (1/2)

The screenshot shows the LEAP: Freedonia software interface. The 'Scenarios' menu is highlighted, and a red arrow points to the 'Add Scenario' icon. The interface displays a tree view on the left with folders for 'Freedonia', 'Key Assumptions', 'Demand', 'Household', 'Transformation', and 'Resources'. The main window shows the 'Activity Level' variable configuration for the 'Household' branch. Below the configuration, a table lists the activity level details:

Branch	Expression	Scale	Units
Household	8	Million	Household

Below the table, there is a chart titled 'Household: Activity Level (Thousand Household)' showing a single bar for the year 2010 with a value of 8,000. The y-axis is labeled 'Thousand Household' and ranges from 0 to 8,000. The x-axis is labeled 'Household'.

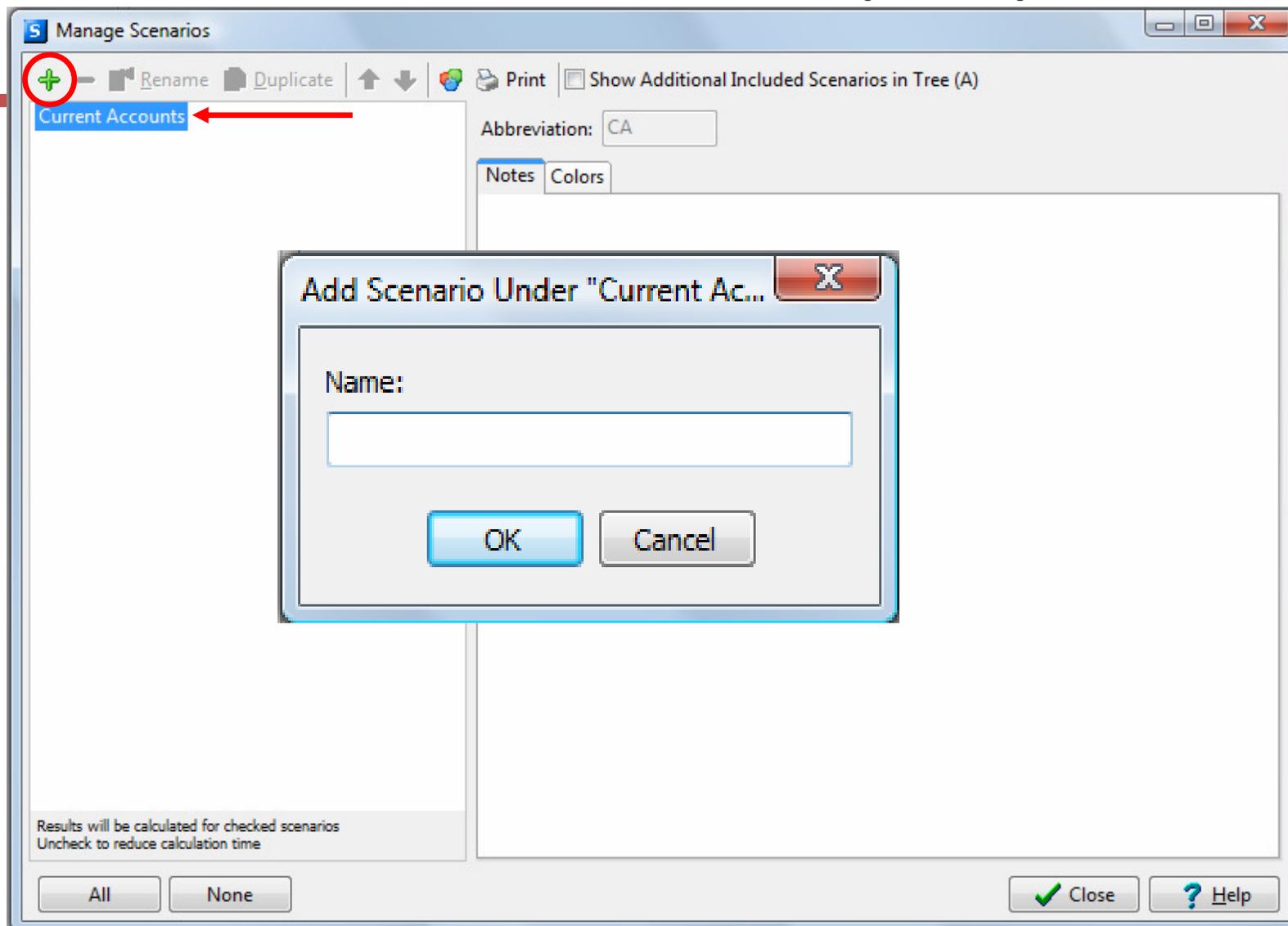


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Add scenarios (2/2)



Insert assumptions

- Use of **Expressions**: mathematical formulae used to specify how the values of a variable change from year to year
 - *In Current Accounts* an expression defines the historical values for a given variable at a branch
 - *In scenarios* an expression defines how a variable changes over time from the First Scenario Year to the End Year
- **Inheritance**
 - Combination of individual policy scenarios



Example: scenario hierarchy with multiple inheritance

The screenshot shows the 'Manage Scenarios' window with the following components:

- Current Accounts:** A tree view showing a hierarchy of scenarios:
 - REF: Reference (checked)
 - MIT: Mitigation (A) (checked, highlighted)
 - LIGHT: Efficient Lighting (checked)
 - EFF: Efficient Refrigerators (checked)
 - CNG: CNG Buses (checked)
 - NAT: Natural Gas + Renewables (checked)
 - IND: Industrial Efficiency (checked)
- Abbreviation:** MIT
- Inheritance:** Based on: Reference
- Additional Included Scenarios:** A table listing inherited scenarios:

Abbrev	Scenario
LIGHT	Efficient Lighting
EFF	Efficient Refrigerators
CNG	CNG Buses
NAT	Natural Gas + Renewables
IND	Industrial Efficiency
- Expression Search Order:** MIT, LIGHT, EFF, CNG, NAT, IND, REF, CA
- Buttons:** All, None, Close, Help

Results will be calculated for checked scenarios
Uncheck to reduce calculation time



Insert/edit expressions

- Type directly into the expression field in data entry table
- Use **Expression Builder tool** (Ctrl-B or 

Expression Builder

LEAP: Freedonia

Area Edit View Analysis General Tree Chart Advanced Help

New Open Save Backup Email Find Basic Params Scenarios Fuels Effects Units Help What's This?

Views

Freedonia

- Key Assumptions
- Demand
 - Household
 - Urban
 - Rural
- Transformation
- Resources

Analysis

Results

Diagram

Energy Balance

Summaries

Overviews

Technology Database

Tags:

Branch: Demand\Household\...

Branch: All Branches Variable: Activity Level Scenario: Current Accounts

Activity Level

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
Rural	30	Percent	Share	of Households

Ditto Ctrl+D

Remainder Ctrl+R

Branch/Variable Ctrl+B

Function Ctrl+F

Time Series Ctrl+T

Use Aliases

Household: Activity Level (% Share of Households)

2010 = 0,0

Urban 30%

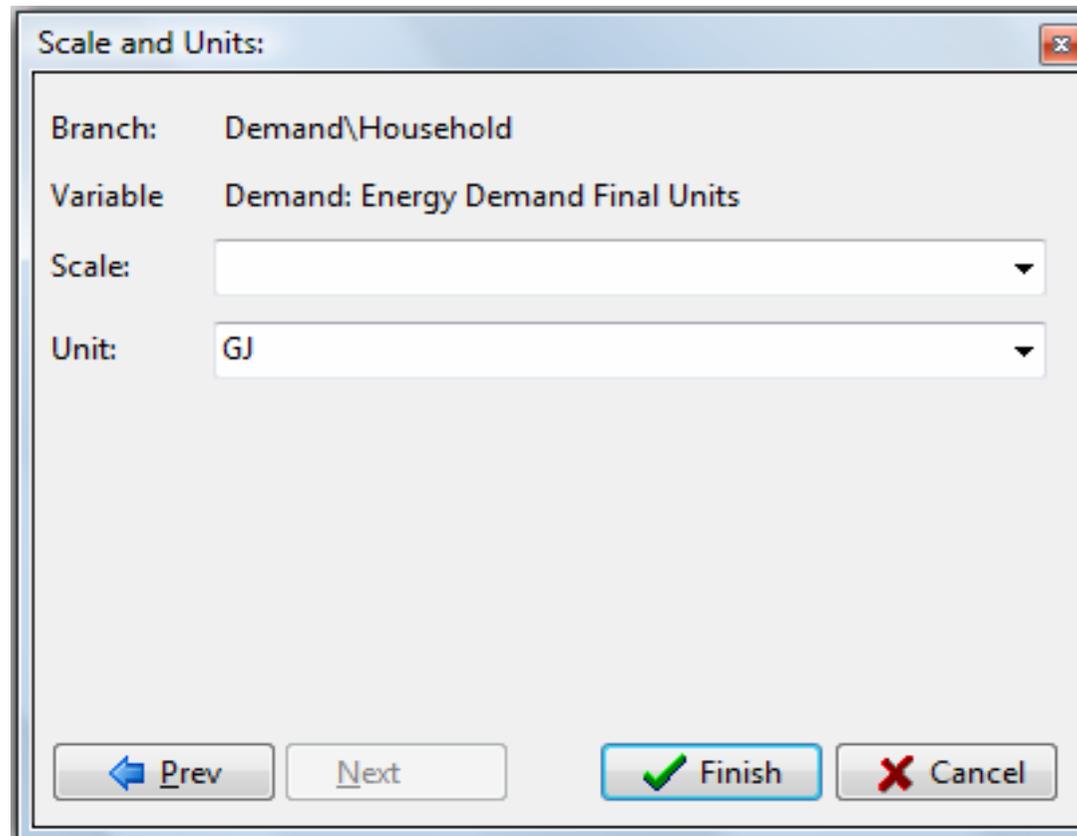
Rural 70%

2014.0.1.20 Area: Freedonia Analysis Registered to promitheas@kepa.uoa.gr until Οκτώβριος 21, 2016



Branch/Variable Wizard

Pop-up window used to select a specific variable at particular branch



Scale and Units:

Branch: Demand\Household

Variable: Demand: Energy Demand Final Units

Scale:

Unit: GJ

Prev Next Finish Cancel

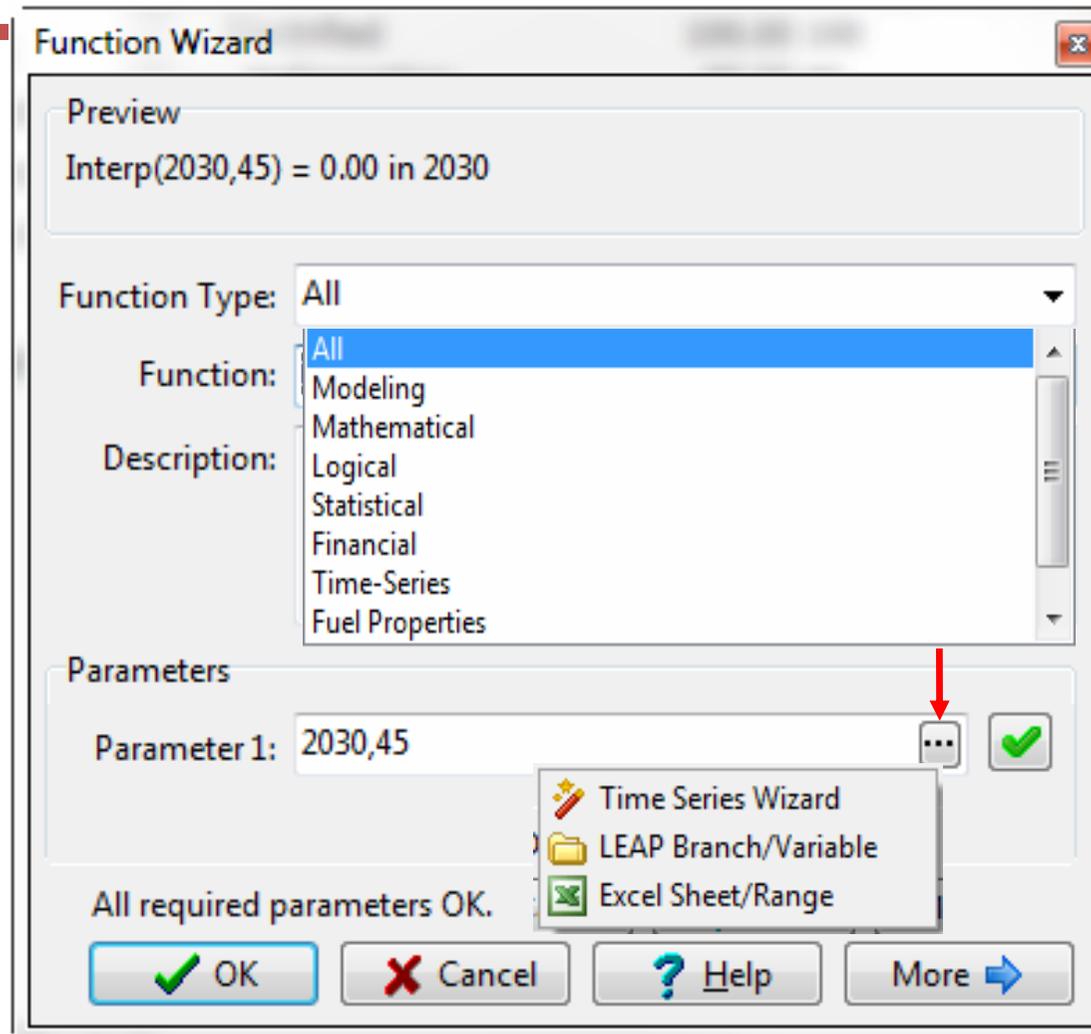


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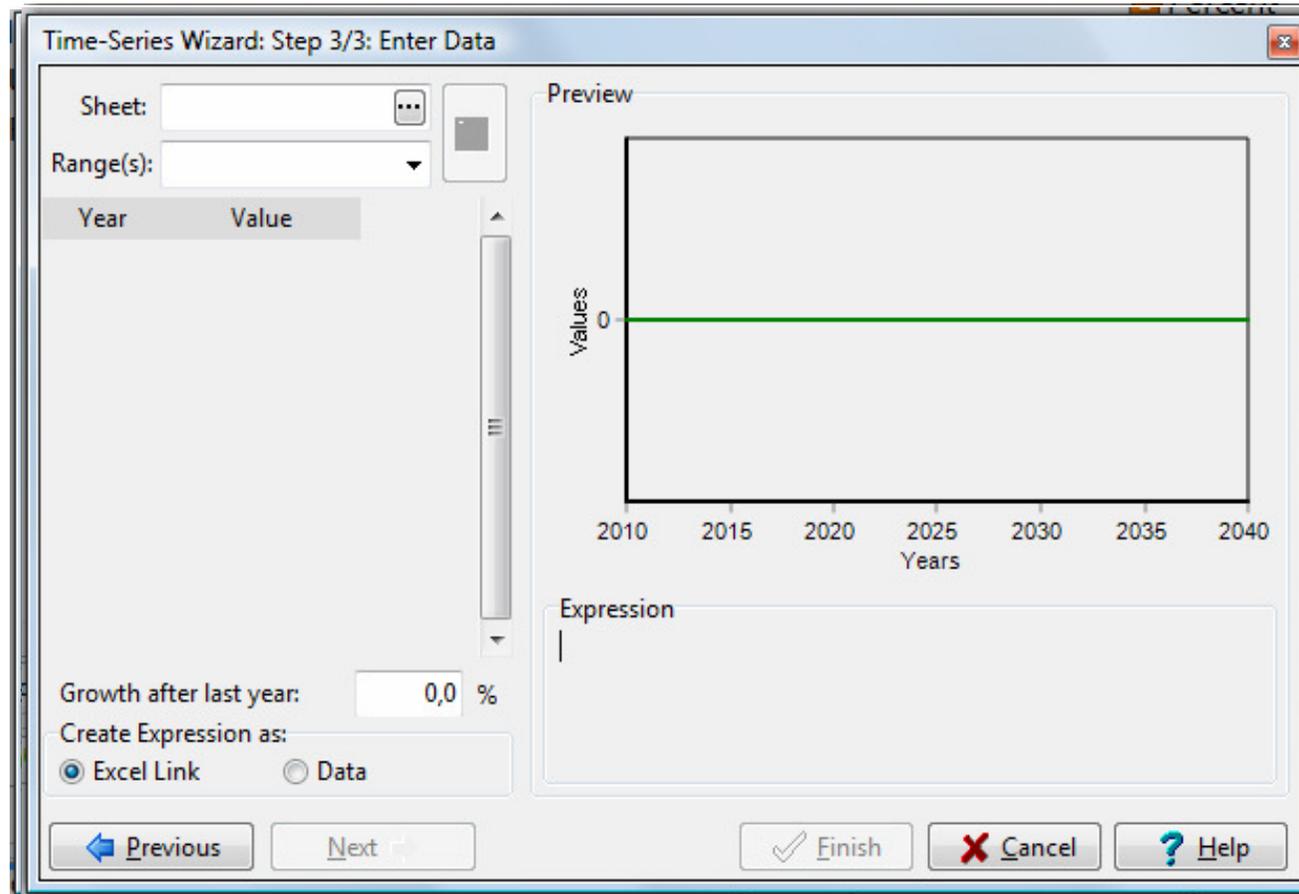


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Function Wizard



Time-series Wizard



Show Results

Step 1: Press *Results View*

Step 2: Press Yes in *Confirm* pop-up window

Step 3: Go to *Result selection box* to pick category of results

Step 4: Go to *Tree* to pick branches for which you wish to see results

Step 5: Click on *Selection boxes* attached to the chart's *X Axis* and *Legend* to pick the dimensions you want to see in the chart or table.

Step 6: Choose *format* in chart, table or both

Step 7: Click on *More* button

Step 8: Export to *PowerPoint/Word/JPEG* and *Excel*



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Step 1: Press Results View

The screenshot shows the LEAP: Freedonia software interface. The left sidebar contains various view options, with 'Results' circled in red. The main window displays the following information:

- Tree View:** A hierarchical tree structure showing the model's components: Freedonia, Key Assumptio, Demand, Household, Urban, Rural, Industry, Transport, Commercial, Transformation, Transmissio, Electricity G, Charcoal M, Oil Refining, Coal Mining, Resources, and Non Energy Se.
- Variable Selection:** Variable: Activity Level, Scenario: REF: Reference.
- Table:** A table showing the expression and scale for the 'Activity Level' variable.

Name	2000 Value	Expression	Scale	Units	Per
Household	8.00	Growth(3%)	Million	Household	
Urban	30.00	Interp(2030,4)	Percent	Share	of Househo
Rural	70.00	Remainder(100)	Percent	Share	of Househo
- Chart:** A stacked area chart titled 'Household: Activity Level (% Share of Households)'. The Y-axis represents the '% Share of Households' (0 to 100), and the X-axis represents the year (2000 to 2030). The chart shows two categories: Urban (yellow) and Rural (blue). The Rural share starts at approximately 70% in 2000 and gradually decreases to about 55% by 2030, while the Urban share increases from 30% to 45% over the same period.

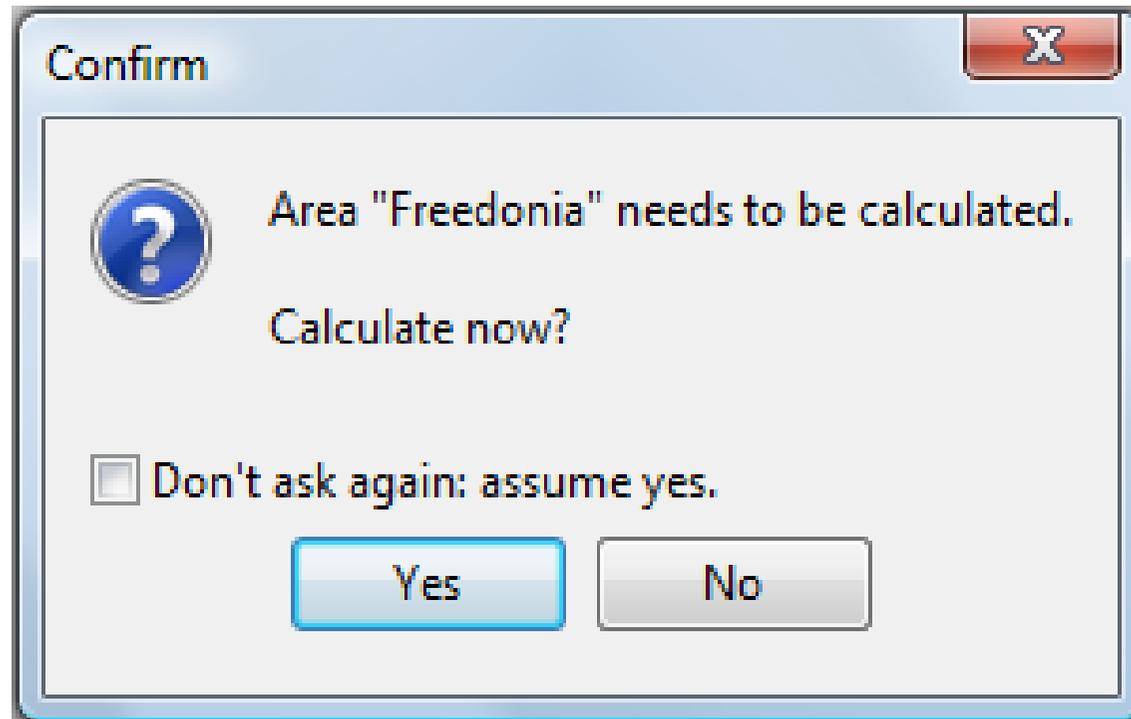


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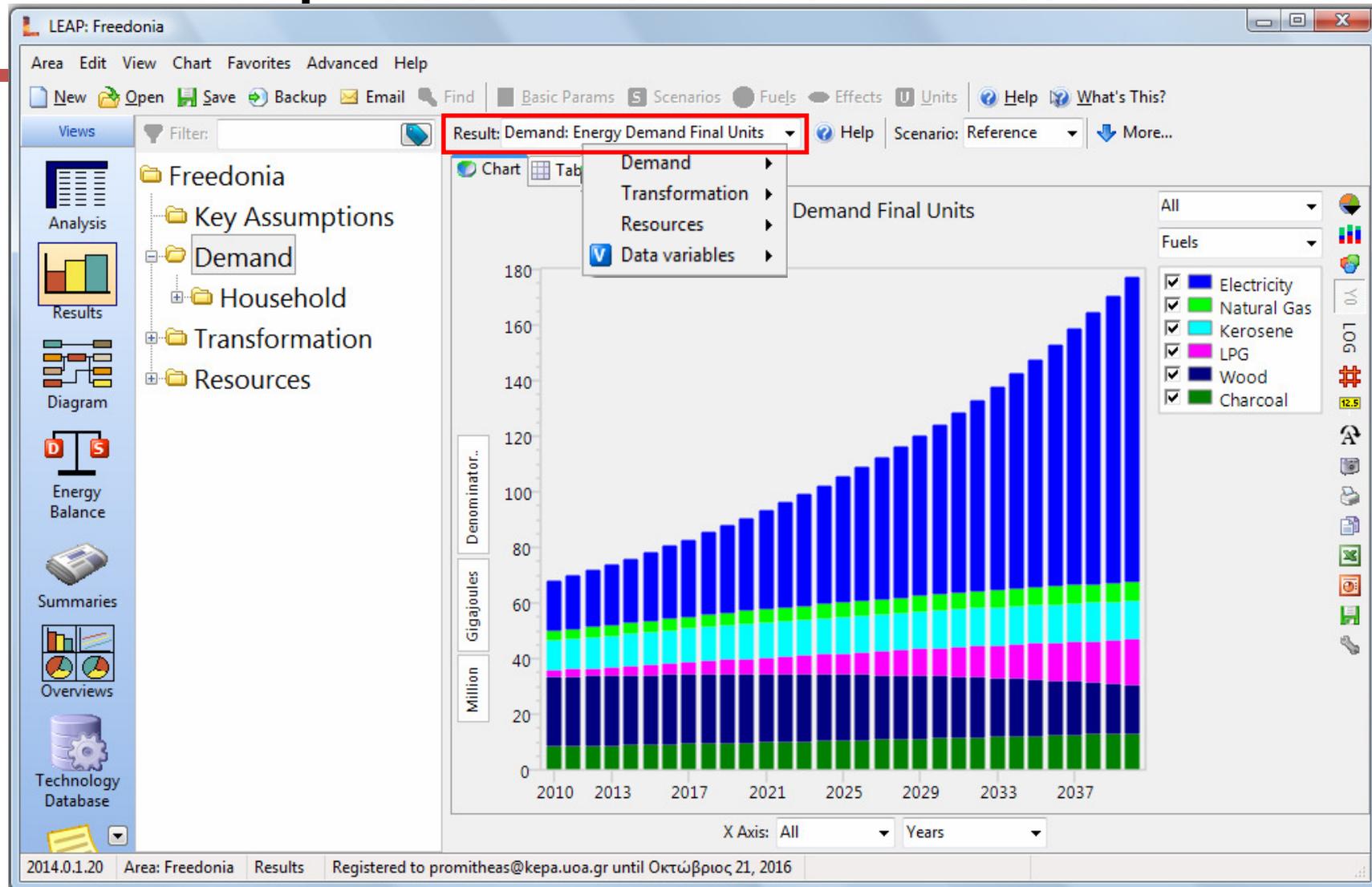


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Step 2: Confirm



Step 3: Result selection box

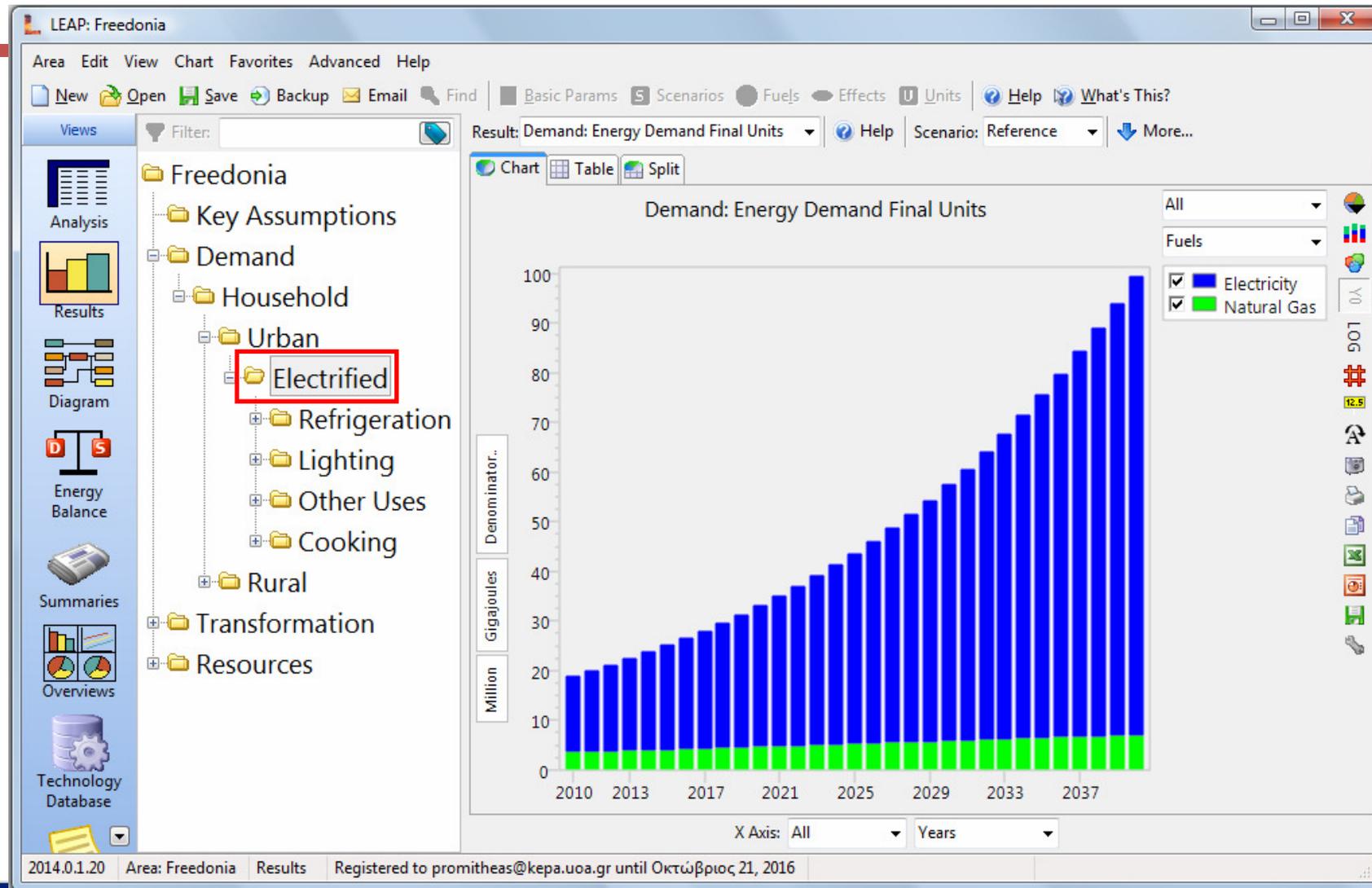


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Step 4: Pick Tree branch

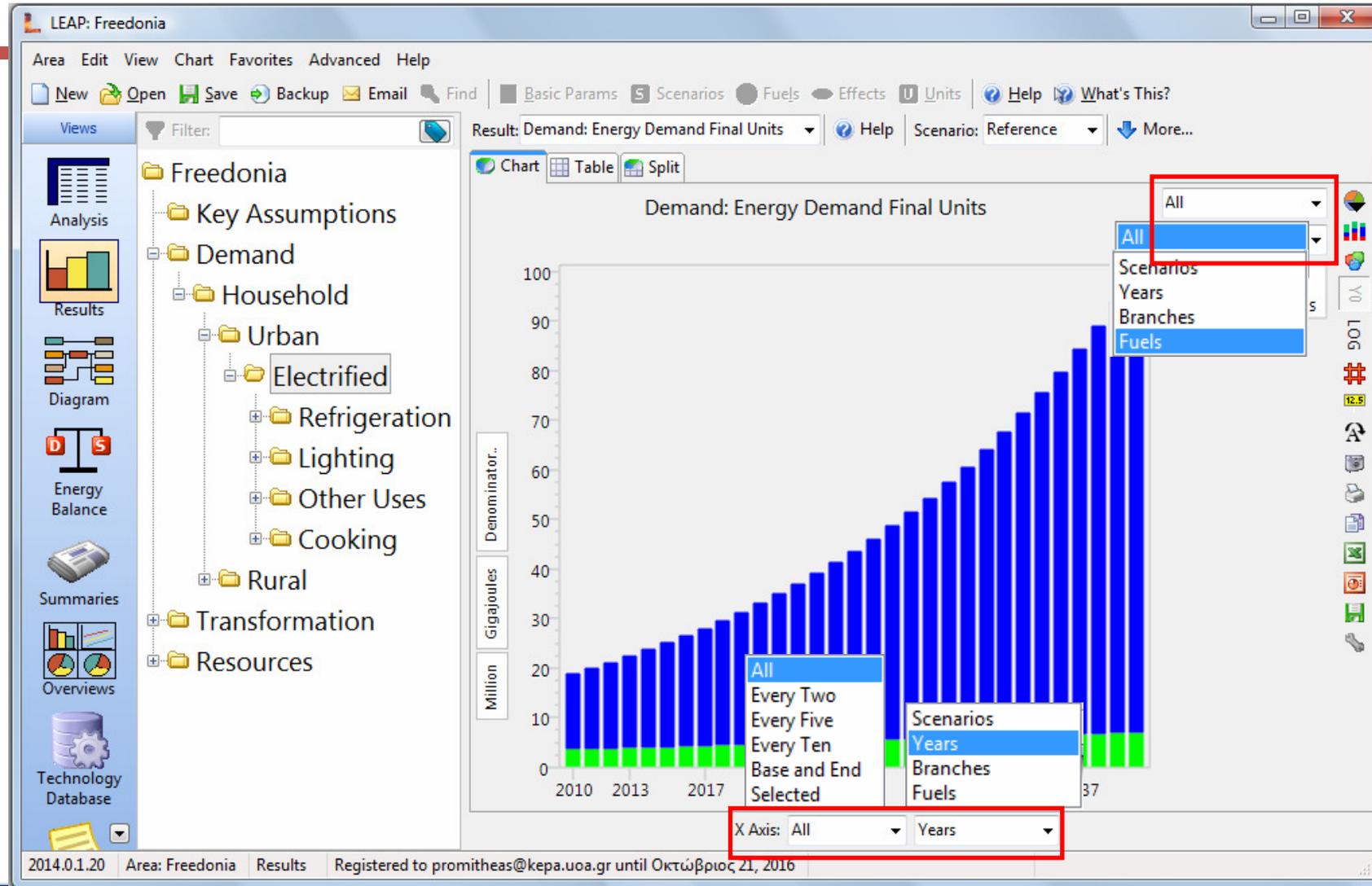


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Step 5: Selection boxes

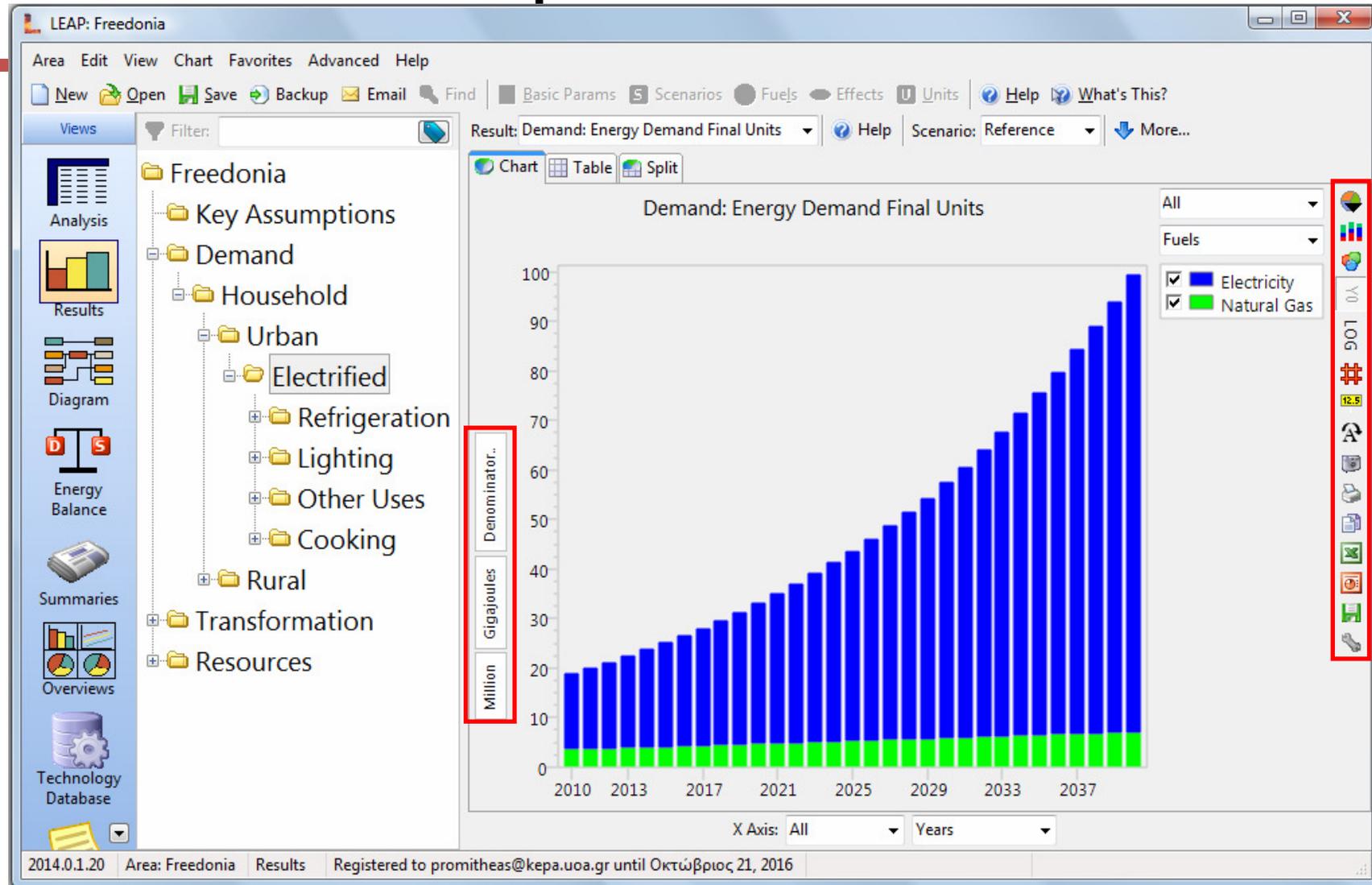


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Step 6: Format

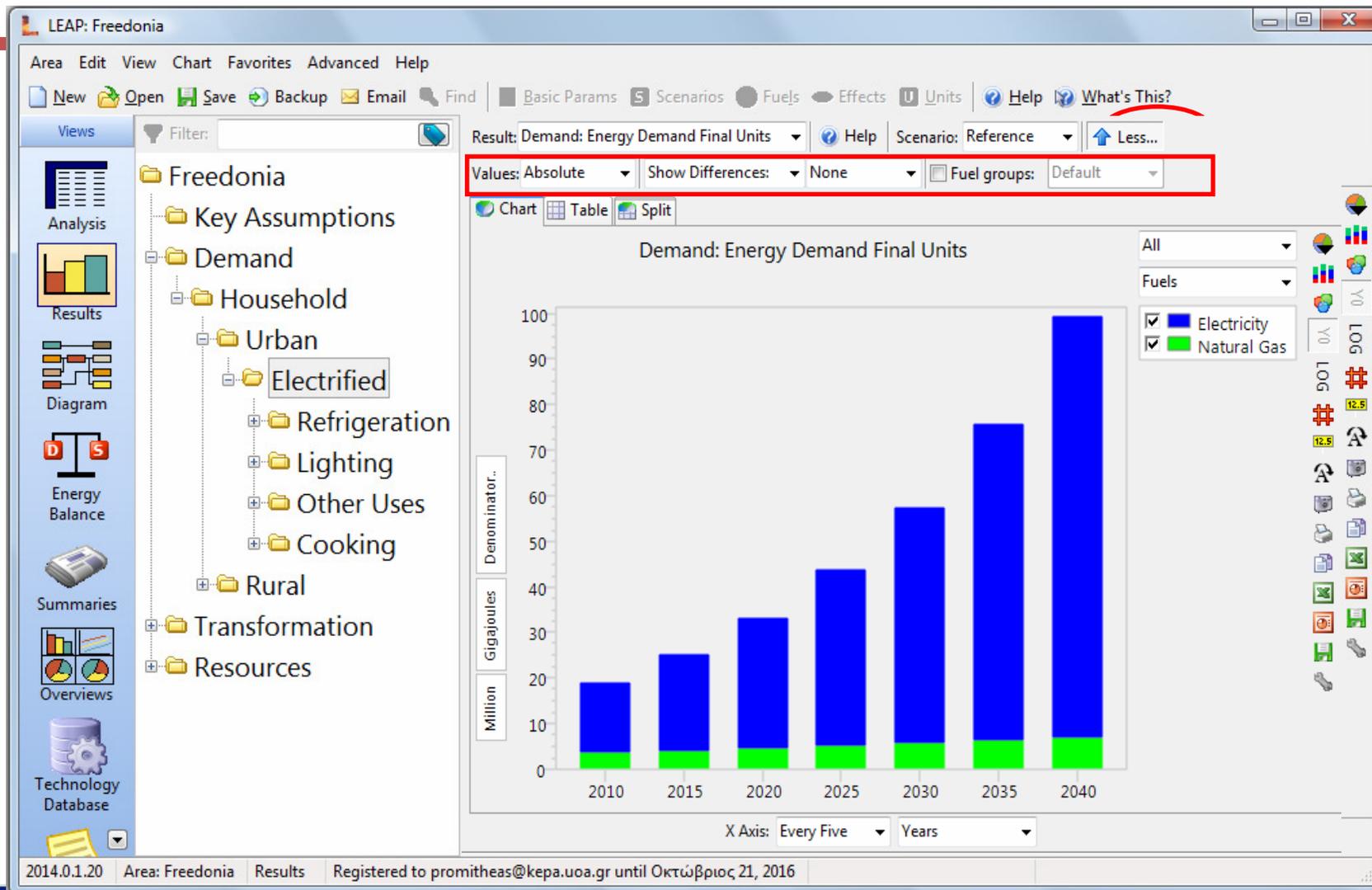


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Step 7: "More" button



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Step 8: Export Charts

Open in PowerPoint

Destination: **Open in PowerPoint**

Copy as: Bitmap

Title Subtitle Legend Left Axis Bottom Axis Options

Label: Demand: Energy Demand Final Units

Font Seqoe UI: 14 point size

Demand: Energy Demand Final Units
Scenario Reference

Million Gigajoules

Electricity
Natural Gas

Open in PowerPoint Close Help

2014.0.1.20 Area: Freedomia Results Registered to promitheas@kepa.uoa.gr until Οκτώβριος 21, 2016



Step 8: Export Tables

The screenshot shows the LEAP: Freedonia software interface. The main window displays a Microsoft Excel spreadsheet with the following data:

	2010	2015	2020	2025	2030	2035	2040
1 Demand: Energy Demand Final Units							
2 Scenario: Reference							
3 Branch: Demand\Household\Urban\Electrified							
4 Units: Million Gigajoules							
5							
6 Fuels							
7 Electricity	15,5	21,1	28,6	38,5	51,7	69,2	92,4
8 Natural Gas	3,4	4,0	4,5	5,1	5,7	6,3	6,9
9 Total	19,0	25,1	33,1	43,6	57,4	75,5	99,3

To the right of the spreadsheet, a 'What's This?' help window is open, showing a table with the following data:

	2035	2040
Fuels	69,2	92,4
	6,3	6,9
	75,5	99,3

The 'What's This?' window also shows a 'What's This?' dropdown menu with 'All' and 'Fuels' options. A red circle highlights the 'What's This?' icon in the bottom right corner of the software interface.



Let's practice!

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