

ANSWER-MARKAL update

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ETSAP Annex XI Meeting

Venezia, Italy

16 June 2009



Main ANSWER-MARKAL Enhancements 2006-2008: 1

- ◆ ***ANSWER-MARKAL presentation at ETSAP Meeting Cape Town South Africa, June 2006 focussed on following enhancements:***
 - Technology Items Filters
 - “Rule-based” Constraints
- ◆ ***By Sept. 2006, with the release of ANSWER-MARKAL version 6.1.9, the following significant enhancements became available:***
 - Flexible TimeSlice version of ANSWER-MARKAL, to handle introduction of flexible timeslicing into GAMS MARKAL code
 - ANSWER-MARKAL “smart” load templates facility, version 5
- ◆ ***Significant contribution by Gary Goldstein, IRG USA, plus US EPA funding support to Noble-Soft Systems via US EPA project with IRG***



Main ANSWER-MARKAL Enhancements 2006-2008: 2

◆ ANSWER-MARKAL version 6.2.15 released August 2007:

- New AnswerV6.exe supporting GAMS-MARKAL code, version 5.7d, including support for more detailed reporting of results in tables T04, T06, T08 and T25
- Multi-select for Delete of Cases from Cases listview (Home Screen, bottom LHS), including very efficient “Delete All Cases” (Remember Case Definitions)
- Run Model handling of error situations improved so easier for user
- New version of the ANSWER-MARKAL “smart” spreadsheets, ANSWERver6.1.xls, extended to allow specification of declaration information and data for Taxes/Subsidies
- New and completely up-to-date ANSWERv6-MARKAL User Manual
- Completely up-to-date ANSWERv6-MARKAL Load Templates Manual
- New Help menu items to allow user to bring up PDF of the ANSWERv6-MARKAL User Manual and ANSWERv6-MARKAL Load Templates Manual



Main ANSWER-MARKAL Enhancements 2006-2008: 3

◆ ANSWER-MARKAL version 6.2.23 released October 2008:

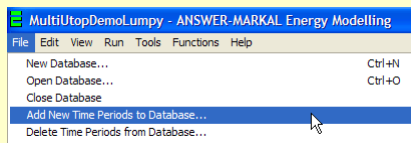
- New AnswerV6.exe supporting GAMS-MARKAL code, version 5.7g
- Otherwise primarily minor enhancements and a few bug fixes



Main ANSWER-MARKAL Enhancements 2009 so far

◆ ANSWER-MARKAL version 6.2.30 released March 2009:

- New AnswerV6.exe supporting GAMS-MARKAL code, version 5.8a
- ANSWER automatically opens ANSWER-MARKAL database that user was most recently working with
- Two new menu items allow user to Add New Time Periods to / Delete Time Periods from their existing ANSWER-MARKAL database (adapting Visual Basic code for same facilities in ANSWER-TIMES):



- New “Technology Filters on Parameter Tab” facility allows use of Technology Filters to filter TS & TID Data and Results on Parameter tab:



“Technology Filters on Parameter Tab” facility

The screenshot shows the 'MultiUtopDemoFLEXTS-P_V6 - ANSWER-MARKAL Energy Modelling' application window. The 'Parameter' tab is active, and a technology filter is applied to the 'INVCDST' parameter. The filter is set to 'FOSSIL-PP Fossil Electric Power Plants' and 'TS data'. The table below shows the results of the filter, displaying the 'INVCDST' parameter values for various technologies and scenarios across the years 1990, 2000, 2010, and 2020.

Scenario	Parameter	Region	Technology	1990	2000	2010	2020
BASE	INVCDST	DEMO	E01	1,200.0000	1,166.6667	1,133.3333	1,100.0000
BASE	INVCDST	DEMO	E10	600.0000	600.0000	600.0000	600.0000
BASE	INVCDST	DEMO	E14	230.0000	230.0000	230.0000	230.0000
BASE	INVCDST	DEMO	E4G	404.0000	367.0000	367.0000	367.0000
BASE	INVCDST	DEMO	E4H	482.0000	435.0000	435.0000	435.0000
BASE	INVCDST	DEMO	E6G	2,260.0000	2,260.0000	2,260.0000	2,260.0000
BASE	INVCDST	DEMO	E6A	340.0000	340.0000	340.0000	340.0000
BASE	INVCDST	DEMO	E6B	1,130.0000	1,130.0000	1,130.0000	1,130.0000
BASE	INVCDST	DEMO	E6C	445.0000	445.0000	445.0000	445.0000
BASE	INVCDST	DEMO	E6E	1,750.0000	1,750.0000	1,750.0000	1,750.0000
BASE	INVCDST	DEMO	E82	592.0000	592.0000	592.0000	592.0000
BASE	INVCDST	UTOPIA	E01	1,400.0000	1,300.0000	1,200.0000	1,200.0000
BASE	INVCDST	UTOPIA	E70	1,000.0000	1,000.0000	1,000.0000	1,000.0000



ANSWER-MARKAL Developments, remainder of 2009 - 1

- ◆ ***New MARKAL extension to permit modeling of Lumpy Retirements***
 - In 2003 ABARE (Ken Noble) enhanced GAMS MARKAL code and ANSWER-MARKAL to permit modeling of Lumpy Investments
 - Recently at request of Intelligent Energy Systems (IES) Sydney, Noble-Soft Systems has enhanced GAMS MARKAL code and ANSWER-MARKAL to permit modeling of Lumpy Retirements
 - IES whose Australian MARKAL model is at individual power station level have tested and are pleased with more meaningful results obtained
- ◆ ***Alternative “new” simplified format for ITEMS data in Excel load templates used for “Import Model Data from Excel”***
 - Including addition of “smart” buttons to new simplified ITEMS, TS DATA, TID DATA sheets (creating alternative “smart” load template format)
- ◆ ***Incorporate Library region approach into version 6 of ANSWER-MARKAL***
 - International Energy Agency's ETP Model



ANSWER-MARKAL Developments, remainder of 2009 - 2

- ◆ ***Introduce “New Case”, “Edit Case” functions to facilitate user creation, modification of Cases with no need to use “Run Model” form***
 - To also be available in association with Batch Run facilities
- ◆ ***Review “Import Model Data from Excel”, “Run Model”, “Import Results” facilities with the aim of speeding up when used for very large models***
- ◆ ***Enhance facilities for handling Bilateral Trade (BiTrade tab)***
 - Adapt ANSWER-TIMES' Trade Process facilities?
- ◆ ***Bring ANSWER-MARKAL User Manual up-to-date***

